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House OKs computer crime bill

Compromise pending; enactment possible in '84

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. House of Representatives last week approved a major computer crime bill that covers unauthorized access to computers used in interstate commerce and the federal government. The House action paves the way for negotiations with the Senate and perhaps final enactment before the 98th Congress adjourns for the November elections.

The House took less than 45 minutes to approve the bipartisan bill on a 393:0 vote under expedited procedures.

Rep. William J. Hughes (D-N.J.), the bill's chief sponsor, hailed the Counterfeit Access Device and Computer Fraud and Abuse Act (H.R. 5616) as a milestone ruling that fills a significant gap in federal criminal statutes, which do not specifically prohibit computer crimes.

Several times, the bill's supporters spoke of notable computer security breaches, such as the recent intrusion into computers at the government's Marshall Space Flight Center in Huntsville, Ala., [CW, July 23]. Rep. Bill Nelson (D-Fla.) called computer crime a highly sophisticated form of bank robbery or trespass and said he hopes the legislation will deter future computer abuse.

The next step for the legislation is an informal House-Senate conference, in which key House legislators will negotiate with their Senate counterparts to write a final, compromise version of the bill, congressional aides said. The negotiators must reconcile the House bill, which combines the computer crime provisions with credit card

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TOP OF THE NEWS

Simply a case of too much. Microcomputer manufacturers have been churning out a supply of machines that is outstripping demand for them. The result? Falling prices. **Page 5.**

■

Always in the chips. Dr. Federico Faggin was on the ground floor of the development of the first microprocessors. In an interview with *Computerworld,* Faggin talks about the early days of large-scale integration and ponders the future of chip technology. **Page 6.**

■

An electric utility is charged up about its implementation of MVS/XA on an Amdahl Corp. mainframe. Hydro Quebec's intent is to migrate its four copies of IBM's IMS data base management system to the single Amdahl 5860. **Page 9.**

■

OA war stories. Attendees at the Syntopican XII Conference and Exposition heard them all from users, vendors and consultants. **Pages 10-14.**

■

A little sweet talkin'. The U.S. has persuaded its Western allies and Japan to place stricter controls on exports of computer systems and software to Eastern bloc countries. **Page 16.**

■

First blood. Mosaic Technologies, Inc. unveiled its first offering, a line of 32-bit graphics workstations based on National Semiconductor Corp.'s 32032 microprocessor. **Page 53.**

■

Informatics, Lotus offer file link

By Paul Gillin
CW Staff

NEW YORK — Lotus Development Corp. and Informatics General Corp. last week announced a microcomputer-mainframe link that Lotus President Mitchell Kapor said represents the tightest coupling of Lotus with any mainframe software product.

Informatics will market Lotus/Answer, a micro-mainframe product that links Lotus' 1-2-3 and Symphony packages to virtually any data base on an IBM mainframe. The software includes Informatics' Answer/DB data retrieval software on the mainframe and Lotus/Answer on the micro. In addition, asynchronous communications or IBM 3270 emulation is required.

Users go through a set of screens on Lotus/Answer to identify the information needed, a spokesman said. The request is sent to the mainframe, where the information is extracted and downloaded into a format that is fully compatible with 1-2-3 or Symphony. Multilevel security is maintained down to the field content level. Personal identification numbers and user profiles are used to control access to data.

Among the data bases and file structures supported on the mainframe are IBM's IMS and Vsam; Software AG of North America, Inc.'s Adabas; Cincom Systems, Inc.'s Total; and Cullinet Software, Inc.'s IDMS. Answer/DB runs under IBM's OS and DOS operating systems with IMS/DC or CICS teleprocessing monitors. Informatics said an IBM CMS version will be available shortly.

The deal means that Informatics has

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A CLOSER LOOK

Casualties mounting in heat of micro market battle

By Edward Warner
and Paul Korzeniowski
CW Staff

The battle for market share among microcomputer manufacturers has intensified in recent months, producing the first significant list of casualties. Four manufacturers have waved the white flag of Chapter 11, and almost 1,000 employees have been sidelined in layoffs (see chart page 4).

"There is fear in Silicon Valley; times are tough, and profits are trim," said Aaron Goldberg, microcomputer market analyst at International Data Corp. in Framingham, Mass. "To survive, a company needs deep pockets because it will have to bleed a lot."

The bleeding has taken different forms: layoffs, production cutbacks, price cuts and curbed expansion. Are these the initial tremors of the oft-predicted shakeout or just a shake-up in a healthy market? Opinions vary.

James J. Edgette, executive vice-president and founder of Entre Computer Centers, said he saw "not the slightest" reduction in demand. "Demand remains growing. Demand remains constant." Edgette added that his 180-store chain experienced no downturn, opened new stores roughly at the rate of one per business day and netted $2 million in its last quarter, which ended May 31.

Corvus Systems, Inc.'s marketing vice-president, Joe Hughes, admitted that the company lost money in the past two quarters, but refused to lay blame on a softening market. "There's still a large demand out there," he observed. "There's just a tremendous number of people selling products now."

Kaypro, Inc. spokeswoman Margaret Phanes, meanwhile, forecast "a competitive summer" for most microcomputer manufacturers, but added, "I can't buy that [talk] that we're in a slump and our sales are down." Kaypro's sales are only 3% off the firm's expectations, set in January, and the firm is now weathering the market in stable fashion, she observed. The firm's layoff of 41 of its 650-person work force was not a direct result of marketplace conditions, she said, but was necessitated when the firm moved into its new, and highly automated, warehouse.

That warehouse, however, had reportedly been needed to store a backlog of

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NEWSPAPER

Jury awards $105,000 to user in case against Milacron

By John Desmond
CW Staff

LOS ANGELES — After an eight-day trial, a Los Angeles County Superior Court jury earlier this month awarded Dellinger & Dellinger, a certified public accounting firm here, $105,000 in a suit charging Cincinnati Milacron (CM) with negligent misrepresentation in the sale of a computer system.

The defense attorney, Robert Long of Latham and Watkins law firm, said the verdict would be appealed to the California District Court of Appeals. He expected the appeal to be heard within a year.

The suit, filed in 1979, alleged that the capabilities of CM's Model 40 minicomputer and accompanying software were misrepresented. The company, a major machine tool and robotics manufacturer, has since stopped manufacturing minicomputers. Attorney David Shaub of Shaub & Rooney here said Dellinger & Dellinger was sold an application package for general ledger, accounts payable, accounts receivable and payroll functions.

"The evidence that was introduced showed that none of the systems worked in the fashion they were supposed to," Shaub said. Both the hardware and the software were alleged to be defective, he said.

Efforts were made to reach a settlement with CM prior to the trial, but Shaub said, "We were far apart."

Long said he was surprised at the jury's verdict. He said Judge James Kolts threw out three of six charges, the jury rejected two more and ruled for the plaintiff on one.

Furthermore, Long claimed that CM never sold Dellinger & Dellinger a system, but that the system was sold by Management Information Systems, an OEM, that also supplied tailored software packages. Management Information Systems reached a settlement with the CPA firm prior to the trial, Long said. Shaub confirmed the settlement.

Also, Long said the CPA firm had been using the Model 40 for one year "apparently with some degree of success," and the firm did not report any problems to the manufacturer until two weeks prior to filing the suit. "Milacron never had the opportunity to solve the problems," according to Long.

The basis of Long's appeal will be that the claim of negligent misrepresentation is really a warranty claim, or a claim that the product did not perform properly, Long said. If the claim did deal with a warranty, "the warranty came from [Management Information Systems]," the attorney said.

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fraud, and the Senate bill (S. 1870), which covers only credit card fraud.

The House bill establishes the unauthorized access of computers used by the federal government or in interstate or foreign commerce as a federal felony if the offender gains more than $5,000 in a year or obtains classified national security information.

The penalty is up to 10 years in prison and a fine of $10,000 (or twice the illegal financial gains); for repeat offenders, the penalty increases to 20 years in prison in addition to substantial fines.

Three misdemeanor categories

The bill also creates three categories of misdemeanor crimes for:

- Unauthorized access to computer financial data bases protected by the Right to Financial Privacy Act or the Fair Credit Reporting Act.
- Unauthorized use or tampering with computer data that affects interstate or foreign commerce and results in financial gain for the offender of more than $5,000 in a year.
- Unauthorized use, modification or disclosure of data in a computer owned or operated by the federal government.

The penalty for the misdemeanors is up to one year in prison and a fine of $5,000 (or twice the illegal financial gains); repeat offenders face a prison sentence of up to 10 years and more fines.

Hughes, chairman of the House Judiciary Committee's crime subcommittee, pushed the bill onto the crowded House agenda less than a month after the committee approved the bill [CW, July 2]. The House floor action occurred under an expedited suspension basis, where regular procedural rules are suspended, no amendments or lengthy debates are permitted and the bill must garner a two-thirds majority vote for passage.

Hughes paid tribute to Nelson, Rep. Harold S. Sawyer (R-Mich.) and Rep. Dan Glickman (D-Kan.) for assistance on the legislation.

Nelson noted that he had worked for four years on computer crime legislation, but his bill (H.R. 1092) was stalled in another subcommittee [CW, May 21].

Glickman, who amended the bill in committee to cover hacking into private financial data bases, warned that the crime bill is only the first step toward protecting sensitive information in the computer age. He said more comprehensive legislation may be needed to encourage the use of technical security measures and to encourage computer operators to be more security conscious.

The Reagan administration did not announce its position on the legislation prior to the House vote.

In June, Congress approved another computer crime bill that authorized the Small Business Administration to educate small systems users about computer security [CW, July 9]. President Reagan signed that bill into law (Public Law 98-362) on July 16.

CORRECTIONS

A recent story in *Computerworld* about a product introduction by Grid Systems Corp. [CW, June 11] incorrectly listed the weight of the company's Compass I and II families of briefcase microcomputers.

In fact, all the Compass personal computers weigh approximately 10 pounds, according to a spokesman for Grid.

The chart titled "Selected independent vendors offering micro-to-mainframe links" [CW, July 2] failed to note that Micro-Tempus, Inc.'s Tempus-Link product also supports Systems Network Architecture/Synchronous Data Link Control communications.

In a *Computerworld* article titled "Managers point out obstacles to micro implementation" [CW, June 25], Stephen Machlis was incorrectly quoted. When referring to DP departments as stumbling blocks to the use of microcomputers, Machlis intended his comments to be applied to the DP departments of firms other than his own.

Also, his firm, Goldman, Sachs & Co. of New York, has 300 IBM Personal Computers in use, not 30 as indicated.

Fujitsu Ltd.'s new Lisp-based machine was mistakenly referred to as the Facom A [CW July 23]. The actual name of the system, intended for use in artificial intelligence applications, is the Facom Alpla.

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The demand for microcomputers has recently slowed, so manufacturers are drastically discounting their products/**5**

CW interviews Dr. Federico Faggin, who has played a significant role in the development of the microprocessor/**6**

Informatics is looking to its three micro-mainframe link products to establish a leadership role in the micro-to-mainframe arena/**7**

Visitors to the 1984 Democratic National Convention voiced satisfaction with the convention's high-tech computing systems and communications networks/**8**

Speculation last week indicated that the four-year European Economic Community antitrust investigation of IBM was on the verge of resolution/**8**

A first user of IBM's MVS/XA on an Amdahl Corp. 5860 mainframe reports that the new capability will allow his shop to expand on-line processing without adding new hardware/**9**

CW at Syntopican XII: The Naval Surface Weapons Center chose Unix to achieve "vendor independence" for its office automation system, a speaker said . . . Manpower, Inc., a temporary employment agency, announced plans to train 700,000 workers in the use of personal computers . . . As Lockheed Missile and Space Co. got into OA, a specialist said, the DP staff was forced to shape up its support services . . . The personal computer revolution is pushing MIS managers into involvement with OA, conference attendees were told . . . Conferencegoers were asked from what type of professional backgrounds OA specialists in their companies have been emerging . . . Keynoter Dr. Marvin J. Cetron said U.S. education is not preparing students for the jobs of tomorrow/**10-14**

The Dennison Manufacturing Co. set up a Help Line to coordinate and track user problems/**15**

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A former Qantel Corp. distributor has won another round in its $5 million court fight with the mini manufactur-er/**23**

The introduction of multiscreen terminals has boosted productivity for an Ohio insurer/**24**

Upper management must take an active role in strategic planning to improve productivity in the software systems development process, according to a panel at the recent National Computer Conference/**25**

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An employee training center found that an office automation system incorporating graphics and word processing boosted its productivity by 40%/**30**

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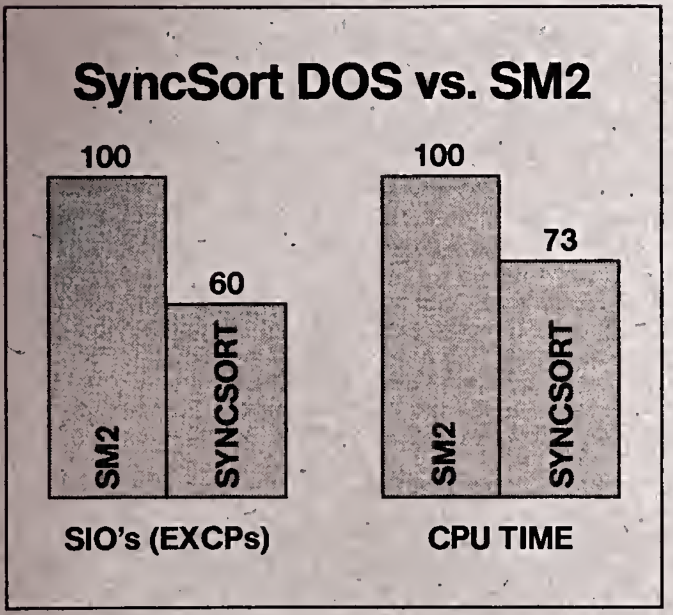

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Anatomy of a Chapter 11 struggle: An insider's view

By James Connolly
CW Staff

WALTHAM, Mass. — When fighting for his own economic life, Dave Simpson found it easier to make what normally would have been emotionally draining decisions.

He shut down his company's production line, laid off employees and placed his firm, Electronic Protection Devices, Inc. (EPD) under Chapter 11 of the Federal Bankruptcy Act in hopes that it could be among the 2% of the Chapter 11 companies to recover from their financial difficulties.

The company, based here, has not fully recovered from its May 14 filing in the bankruptcy court, but company President Simpson remains optimistic that he can draft a plan to pay off $1.8 million in debts. He also has advice for other businessmen, particularly in the volatile computer industry, who may face bankruptcy.

"You're simply looking at everything as a business decision without any emotion involved because it's your survival at stake," Simpson said in a recent interview at his office.

EPD soared to the top of the surge protection field in 1981 with the introduction of the Lemon and other Fruit Line surge protectors, such as the Lime, Peach and Orange, which are targeted to the personal computer market. But it apparently fell victim to an affliction that has hit many organizations that find sudden success in the high-tech field. According to Simpson, he and his cofounder, production head Daniel Kocuzzo, drifted apart amid differences regarding how the company should be run because Simpson came from a marketing background and Kocuzzo from a technical background.

The differences exploded into a feud earlier this year when the company needed cash to deal with the constraints caused by a $400,000 promotional campaign for a software training product called Fast Train, which was two months late reaching the market. The feud led to Kocuzzo walking out of the building and an investment deal falling through, Simpson said.

When it appeared that the winner of a $6,000 judgment against EPD might force the firm into receivership, Simpson filed a petition for Chapter 11 protection, which prevents creditors from pursuing collection until he files a reorganization plan within 120 days. At the peak of EPD's difficulties, production ceased for 1½ weeks.

"You're looked upon as a company with some kind of a taint, even if you recover," Simpson observed. "When someone goes into Chapter 11, you have to make sure that you keep constant communication between you and your customers so they understand that Chapter 11 is not final."

He said individual salaries have not been cut in general for the remaining 34 employees, adding that doing so would break employee morale.

"You have to make them understand that the work load is going to be much greater. In this particular case, we set production goals, and if they meet the goals, they are given bonuses," he said.

Another key to maintaining morale is for executives to make themselves available to their workers. "You have to be in the building and out on the production floor to reinforce the concept of coming out of your difficulties. The employees have to see the light at the end of the tunnel," he commented.

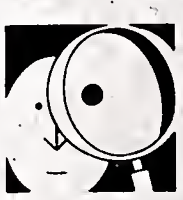
To Simpson, that light includes turning a profit for the months of June and July, reducing a backlog of orders, planning to introduce two products in the fall and anticipating sales of up to $8 million for 1984, compared with $500,000 in 1982 and $5 million in 1983.

But he also warned, "We are going to need an outside investor unless we can convince our creditors to take some kind of payoff plan over a number of years, and I don't think they are going to go for that." Even the search for such an investor, which Simpson said involves discussions with a half-dozen companies, is hindered by pitfalls. He noted that EPD has had suitors who were merely competitors wanting to examine the company's books and procedures to gain an edge in the market.

Chapter 11 provides shelter for debtors, leaves creditors in the cold

In just two months, four microcomputer firms have sought protection under Chapter 11 of the Federal Bankruptcy Act: Franklin Computer Corp., Actrix Computer Corp., Logical Business Machines, Inc. and Electronic Protection Devices, Inc.

Chapter 11 is one of the three most-used sections of the Bankruptcy Act, according to Pat H. Scanlon, chairman of the American Bar Association's Committee on Bankruptcy. Firms filing for Chapter 11 have 120 days, often even more, to formulate a plan to pay off their creditors, Scanlon said.



Creditors in many instances do not receive full payment on the money owed them, Scanlon elaborated, but Chapter 11 provides the opportunity for creditors to at least get some compensation, often via a payment schedule.

The four firms that filed for Chapter 11 cited cash flow difficulties as reasons for their action. Porter Hurt, chairman of the board of Actrix Computer, said his firm's "downfall came in that we did not have the multimillion dollars to do the marketing [we needed]."

Selling stock

Hurt said he holds 80% of Actrix's stock, but is seeking to sell all of it and vacate his position with the firm's board. Actrix, he said, found marketing through dealers to be a "disaster" and has set its sights on a direct marketing plan.

Franklin Computer was also having trouble paying its bills, including a $435,000 obligation to the law firm that defended Franklin in a recent copyright infringement lawsuit that was brought by Apple Computer, Inc. Apple was awarded $2.5 million in a settlement of that lawsuit in January.

Attorney Scanlon said he has seen some firms revitalized by the Chapter 11 experience, but many more have "ended up in belly-up, down-the-tubes situations."

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product parts that had, at one time, been kept in a circus tent on the firm's Solano Beach, Calif., grounds. In March, Kaypro cut the price on its Kaypro II by $300 to $1,295.

Shipment delays

Two of the wounded, Gavilan Computer Corp. and Corvus, claimed that delays in initial shipments of their new products and a need for cash were to blame for their decisions to lay off workers.

Venture capital had freely provided cash to companies like Gavilan and Corvus, according to industry analysts.

"The tidal wave of venture capital money that has washed over Silicon Valley, [Massachusetts'] Route 128 and other high-tech heavens over the past few years has unfortunately induced heady intoxication among budding entrepreneurs," claimed William Zachman, vice-president at IDC. As investors became leary, the tidal wave ebbed, and companies' weaknesses became evident.

Other vendors said that the market is not as healthy as analysts claim. Condor Computer Corp.'s manager of marketing communications, Rich Aure, said there were two reasons why the firm recently engaged in cost cutting designed to save between $400,000 and $500,000 by the year's end.

Chapter 11

- *Actrix Computer Corp.*
- *Electronic Protection Devices, Inc.*
- *Franklin Computer Corp.*
- *Logical Business Machines, Inc.*

Layoffs

Condor Computer Corp.	20
Corous Systems, Inc.	65
Diablo Systems, Inc.	284
Eagle Computer, Inc.	85
Gavilan Computer Corp.	83
Kaypro Corp.	41
Software Arts, Inc.	67
Vector Graphic, Inc.	43
Visicorp	110
Franklin Computer Corp.	167

CW CHART

One reason, he said, is that "the market's soft. The second [reason] goes back to good management and business practices." Condor's layoffs, he said, were part of an across-the-board cost-reduction plan that included closing one of Condor's two Ann Arbor, Mich., buildings and nearly halving its advertising budget from $65,000 per month to between $30,000 and $35,000.

Software Arts, Inc. and printer manufacturer Diablo Systems, Inc. attributed the layoffs to a decrease in market demand, increase in operating expenses and a rise in competition.

Competition should continue to intensify, analysts predicted. "The industry doesn't need 17 word processors for the IBM Personal Computer," Goldberg claimed.

"It can support maybe two or three. The same is true for the 37 IBM [Personal Computer] clones — maybe two or three are needed," he added.

To survive, a company must begin to take market share from its competitors, according to Goldberg. "Many companies do not have the marketing or technical expertise to accomplish this task," Goldberg added.

When will the 37 clones begin to dwindle to two or three? "The market has just begun to shake," said John Kiefer, senior analyst at Infocorp. "I think over the course of the next 18 months, the shakeout will materialize."

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NEWS

Supply / demand imbalance driving micro prices down

A CLOSER LOOK

By Paul Korzeniowski
and Ed Warner
CW Staff

If high prices previously prevented your department from purchasing microcomputers, now may be a good time to buy. In concert with the supply-and-demand axiom, microcomputer prices are plummeting, according to industry observers.

As manufacturers were increasing production to meet the spiraling demand that has characterized the microcomputer market, demand dramatically dipped. Future Computing, Inc., a Richardson, Texas, market research firm, estimated that Apple Computer, Inc.'s and IBM's sales at some retail stores dropped by as much as 30% this spring.

Increased production coupled with decreasing sales have forced manufacturers and retailers to discount products. "Even the special low prices listed in newspaper advertisements are a joke," stated Seymour Merrin, president at Computerworks, a Westport, Conn., retailer. "A buyer can easily walk into a store and barter for an even better deal."

In addition to discounting, manufacturers are attempting to survive market uncertainty by curbing expansion plans and laying off workers (see related story page 1).

Industry observers listed a number of reasons for softening demand. A principal reason was the anticipation, announcement and aftermath of IBM price cuts on its Personal Computer line. Retailers reported that product demand slackened as rumors of the price cuts surfaced. "When the price cuts were announced, demand for the IBM Personal Computer dropped so fast that the market looked like a scene from *The Day After*, Merrin said.

Cuts alarmed buyers

Rather than luring potential buyers with lower prices, the cuts alarmed possible purchasers. "Customers aren't dummies," Merrin noted. "As soon as the cuts were announced, buyers began wondering what IBM was going to do next."

Historically, price cuts precede the introduction of a new product, observers noted. Rumors of a new IBM Personal Computer are stifling sales. "Many customers are waiting to see what the new IBM machine is like," said Tony Morris of Morris Decision Systems, Inc., a New York dealer.

Another cause of the slackening demand is a saturation of personal computers in some corporations. "We aren't buying as much equipment now as we once were," said Kenneth A. Edelstein, manager for microcomputer support in the Information Services Department at New York's Merrill Lynch Pierce Fenner & Smith, Inc. "We are primarily a spreadsheet environment, have made our decisions and are no longer shopping for different types of equipment."

Support considerations are also limiting purchases. "Corporations have a limited amount of support resouces, and many have reached their maximum support level," Morris said. Naomi Karten, a microcomputer consultant at Karten & Associates in Randolph, Mass., added that companies can't increase staff simply because there are more microcomputer users.

In addition, initial market projections may have been based on exceptional circumstances. "Large corporations waited for IBM to bless the market before entering it," Morris said. "There was an artificial pent-up demand for a product from IBM. That demand has been satisfied, so the market may have settled into a realistic growth pattern."

Whether discounts will help or hurt sales is unclear. "For the department buyer, price is an important purchasing factor," said Karten, who has served as a microcomputer manager. "The company I worked for tried to direct its buyers to specific retailers. But the user would often purchase hardware and software where he could get the best price. He would sacrifice support for price and often buy software from mail-order companies."

For many corporations, price is not an important buying consideration. "Some companies are willing to pay more for a product if the seller provides technical and buying support," Morris said.

Gene Maimin, project manager for microcomputer support at Columbia Pictures Industries, Inc., added, "Our firm has resisted the temptation to plunge into agreements that seemed economical."

Discounts and low prices may continue until the fall. "When the buyers see the new IBM machine and realize that it is a different class of machine from the IBM Personal Computer, they may start buying again," Morris predicted.

Business will pick up, Merrin forecast. "There still is growth in the market, even though the growth curve has changed significantly," Merrin predicted. "Today, sales are below where they should be. But the market should change in 30 to 90 days when buyers realize that you can't have a mainframe for $5,000."

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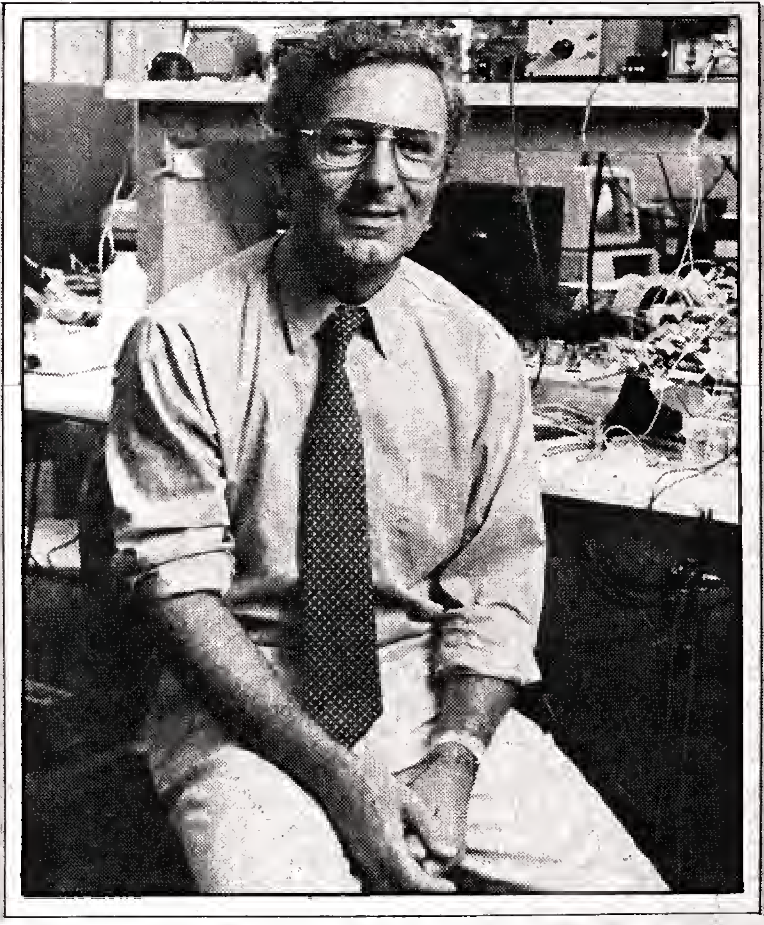

Federico Faggin

Dr. Federico Faggin has played a significant role in the development of the microprocessor. In 1968, while at Fairchild Industries, Inc., he helped to develop silicon gate technology, which was the first step to large-scale integration and very large-scale integration.

From Fairchild, he went to Intel Corp. and took part in the implementation of the first generation of microprocessors: Intel 4004, 8008 and 8080. In 1974, he moved to Zilog, Inc., where he designed the Z80 microprocessor family. Below, Faggin says he "started" Zilog. In 1980, he left the microprocessor field and founded Cygnet Technologies, Inc., manufacturer of Cosystem, which integrates voice and data for the IBM Personal Computer.

The following interview was conducted recently by Computerworld *staff writer Paul Korzeniowski.*

Q *How did the 8080 evolve?*
The first project that I was involved with at Intel was to develop integrated circuits for a Japanese company, Bizcomp Corp., which wanted to use the chips for its calculators. That project produced the 4004, a 4-bit microprocessor. Later, [Datapoint Corp.] asked Intel and [Texas Instruments, Inc.] to develop a chip that emulated Datapoint's intelligent terminals. When we finished that project, Datapoint did not want the processor, which was the 8008, because it was slow. As I promoted use of the 8008, it was obvious that the market wanted a more powerful chip. So I proposed the 8080 processor, which was introduced in 1974. It had a faster cycle time than the 8008, and we thought it could break the microprocessor market open.

When did the idea of using microprocessors for microcomputers first arise?
The first company to produce a microcomputer was a French company, RPE. Then other companies like [Imsai, Inc.] and Mits introduced products that were solutions looking for a problem. They produced small, generic microcomputers with primitive operating systems.

The market was primarily for hobbyists, and powerful software was nonexistent.

Q *When did you leave Intel?*
I left Intel in 1974 and started Zilog with money from Exxon Corp. Zilog introduced the Z80 in March 1976. The Z80 represents the last 8-bit microprocessor as the industry moved to 16-bit microprocessors.

Q *When you were at Zilog, did Zilog talk to IBM about using a Z80-family chip in the IBM Personal Computer?*
At that time, Exxon had declared war on IBM, so IBM did not show much interest in the Z80 family. We were never seriously considered.

Q *How do you view IBM's entrance into the microcomputer market?*
IBM created the market. When IBM makes a choice, it creates the standard. Once IBM chose the 8088, the microprocessor game was over, and Intel had won. No other microprocessor will ever get as large a slice of the microcomputer market as the 8088 family. From a marketing point of view, the 8088 family will have a lion's share of the market, and that is the name of the game.

Q *Are there any limitations to IBM's choice of the 8088?*
Yes, the 8088's capabilities do not set the world on fire, but there is more to a microcomputer than the microprocessor. There are other things needed to develop the system. Much of the reasoning for IBM's choice of the 8088 must have been the availability of peripherals for that microprocessor. Limitations are not always in the microprocessor; they may be in the Bios [basic I/O subsystems] or the I/O mechanisms. Even though the 8088 is not the fastest microprocessor in the world, software can mask a number of its limitations, and you can even add faster microprocessors to a machine. If the industry had stopped evolving and was not introducing better chips, then I may be concerned. But that has not happened.

There are new chips coming out from Intel. The 80286 appears to be an important chip. Can there be a better standard than the 8088? Yes, but that question is irrelevant because you can't undo history.

Q *Did the way the microprocessor market evolved surprise you?*
Yes and no. There was no question that the microprocessor would create a revolution. If someone asked me in 1972 how many microprocessors would be sold in 1980, I would have guessed in the 10 million range. The number was closer to 100 million.

I also expected that traditional computer companies would turn to the microprocessor. Yet they resisted, and early innovators came from outside the industry — people who were turning to electronics for the first time.

The same phenomenon occurred with microcomputers. They began penetrating corporate America only after IBM gave its blessing, and they are being fought by traditional MIS managers.

Q *What causes this resistance?*
A natural tendency called inertia. If a company is used to doing things in one way, it builds infrastructures that keep it moving in a certain direction and that resist change. This inertia is necessary for stability. If you change everything at all times, it would be chaos. Another reason is that the change was in an area where these companies were experts. When you try to tell people who design computers how to build a better computer, they say, 'YOU are trying to tell ME how to build a better computer? Get lost.' If you give someone else a microprocessor, there is little resistance; there is nothing to defend.

Q *What has to evolve for the industry to move to the next generation of microprocessors?*
Only after personal computer users become sophisticated enough to realize that some applications are slow will they demand faster processors. In other markets, that has already occurred. For example, engineering workstations require 1 to 5 millions of instructions per second per person. That can't be done with an Intel line microprocessor, but you can use a [Motorola, Inc.] MC68000 to attain those speeds, and that type of microprocessor is used.

Q *What happens as users demand faster processors?*
Vertical markets for types of machines will emerge: There will be companies offering engineering workstations; Apple will rule home and education markets; IBM will dominate business and office applications. Each manufacturer has a very different type of machine. You can do word processing on an engineering workstation, but that is not very efficient. Networks that tie different types of machines together can increase efficiency. Connecting these machines is a difficult but necessary task that will take the foreseeable future. Only by completing this step will we realize the true power of the microcomputer.

Q *Are the building blocks for these networks now available?*
The IBM Personal Computer has established the cornerstone of the microcomputer evolutionary process. At the lowest level, you will always have an IBM Personal Computer. Office automation will be like telephone networks where the old and the new coexist: iron fused with copper works with fiber optics in satellites.

To the user, these technologies are immaterial. OA has to go that way. Microcomputers are the key unit; they will stimulate that market for the first time. We have been talking about office automation for the last 10 years, but nothing has happened. Personal computers came in from left field. Today, they are squarely in the office, and we are beginning to forge real OA breakthroughs.

Q *What additional building blocks will be needed?*
Integrating the telephone and the personal computer will be the next major step. That sounds simple, but it requires more than putting a telephone next to the personal computer. Once you integrate those technologies, you begin to open up new application areas. Communications is the next frontier for OA, and it will take many forms. To enter this frontier, the personal computer will have to coexist in all kinds of environments: standard telephone and Systems Network Architecture.

Q *What will this revolution bring?*
Data base services will reach critical mass. If you look at [Dow Jones and Co.] and other services, the user can't justify paying for them. The vendor doesn't supply a service that the user wants. Consequently, they are not growing as fast as they could be. There is a chicken or egg situation. The user doesn't subscribe, so the company doesn't have the money to add the service the user desires. When you tie personal computers together, you lower the cost of these products. Use of these services will increase, and new applications with a lot of pizzazz will emerge. Electronic mail will also be a major application.

In 10 years, most business correspondence will be sent by electronic mail, not the [U.S. Postal Service].

Informatics targets links for market leadership

By Paul Gillin
CW Staff

WOODLAND HILLS, Calif. — Despite its 22-year history in the software and services industry, Informatics General Corp. has never been generally recognized as a leader in any broad market area. One reason is that the company offers a broad spectrum of software products, ranging from data encryption to application generation, as well as professional and time-sharing services. Another is that many of its products are oriented toward specific industries or hardware.

However, Informatics' Software Products Group is looking to turn that image around with the introduction of three microcomputer-to-mainframe link products in the past 16 months.

The Answer series is intended to tie diverse mainframe data bases closely into micro software from three of the largest companies in that industry: Lotus Development Corp., Visicorp and Ashton-Tate. Group Vice-President Merritt Lutz maintained that the offerings are an attempt by Informatics to set itself up as a standard for horizontal micro-mainframe links.

Horizontal links differ from custom links in that they can run with most data bases and file structures. Custom links offer more elegant features, but are usually restricted to a single piece of mainframe software.

The advantage of the horizontal link is that "it gets to the broadest number of users," said Mitchell Kapor, president and founder of Lotus. "Custom links give you value you don't get with the generic link, but it's important to give users universal access."

Lutz agreed that custom links sold by mainframe software vendors offer some advantages. "They can probably do a better job with the data from their own general ledger package than I can," he said. But he added that he believes large companies are interested in more universal access.

"We believe the buying patterns of the Fortune 1,000 firms are shifting toward the users having a great deal of influence," he said. "I want to complement their decisions."

Sailing has not been smooth so far. Visianswer, a link between Informatics' Answer/DB and Visicorp's Visi Calc that was announced in April 1983, did not sell well until recently. "We expected it to sell far more rapidly than it did, with short sales cycles and high volume," Lutz said. "What we found was that a product like this quickly became a strategic decision for customers, and we were back into 90- to 120-day sales cycles."

One reason was that customers did not understand the difference between terminal emulation and generalized links, he stated. As the market has become defined, Visianswer sales have picked up.

Lutz said micro-mainframe links will become a major strategic thrust at Informatics in the future. "The micro-mainframe link is really just a first step," he said. "The bigger issue is the integration of technologies." He said the company's Mark IV and Mark V application development tools are inherently designed for distributed application generation. "That's a perfect underlying engine for a future generation of Answer products," he said. "In the future, you'll be seeing Mark V technology being applied to micro-mainframe integration."

LINK from page 1

now concluded agreements with three of the largest vendors of integrated micro software. Virtually identical agreements have been announced between Informatics and Visicorp [CW, April 18, 1983] and Informatics and Ashton-Tate [CW, June 4].

Lotus has been involved in numerous value-added reseller agreements with mainframe software vendors. However, Kapor called Lotus's relationship with Informatics unique.

"With some of our [resellers], we've had a direct interchange [capability], but not with this level of intensity," he said. Kapor added that the agreement with Informatics involved "a significant amount of marketing and development talent in terms of man-months" and called the Informatics deal one of the "strategic alliances" Lotus expects to announce in coming months.

Lotus/Answer requires an IBM Personal Computer with a minimum of 256K bytes of memory, two double-density diskette drives and IBM's PC-DOS 2.0 or 2.1. Communications requirements can be satisfied with Digital Communications Associates, Inc.'s (DCA) Asynchronous Irmaline-Irmalette combination and a modem or DCA's Irma board or Forte Data Systems, Inc.'s Forte board.

A typical configuration consisting of an Answer/DB module for a mainframe and Lotus/Answer for 50 micros costs $45,000. The product will be available at the end of August.

Informatics is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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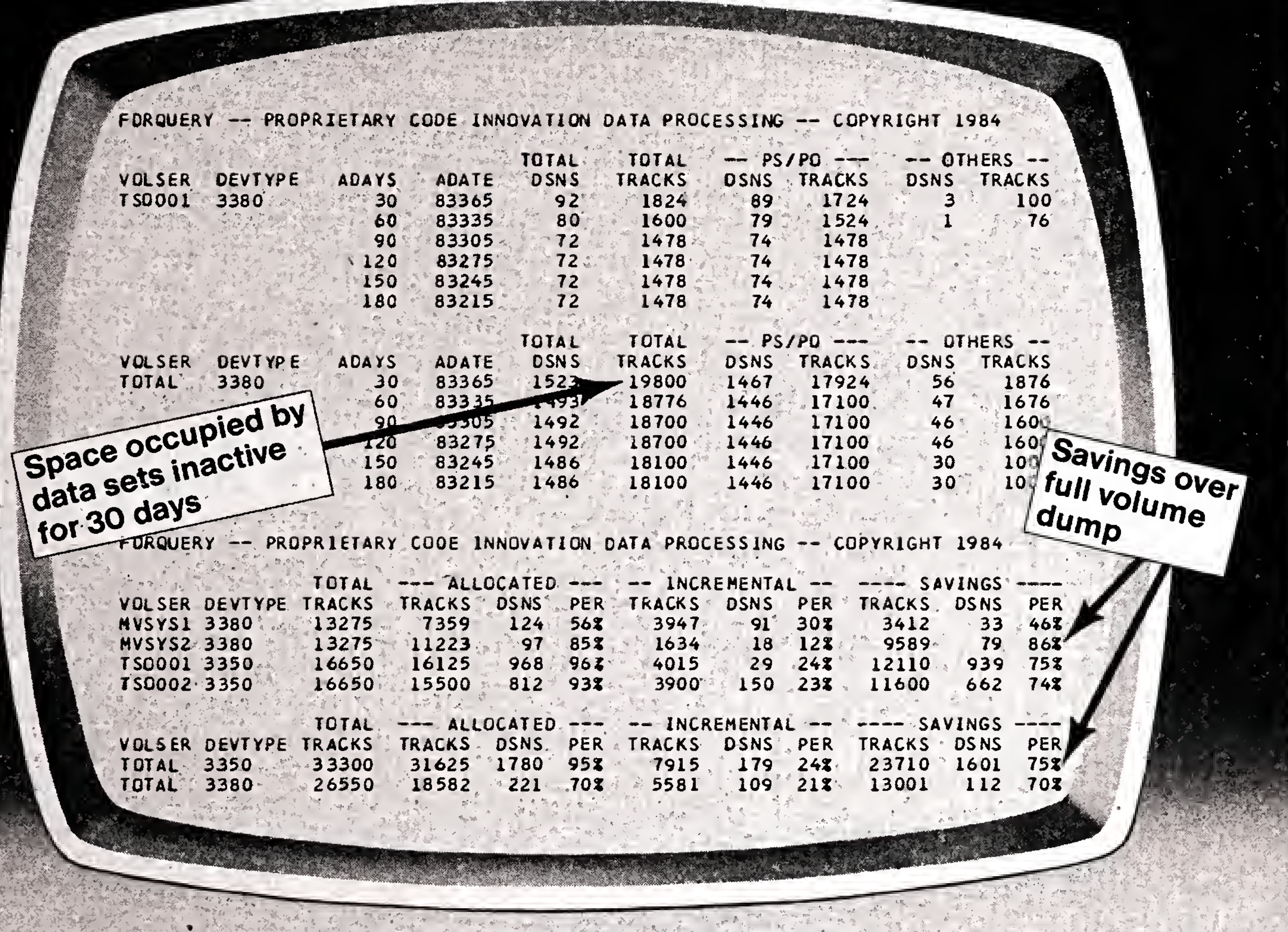

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                                  TOTAL   TOTAL   -- PS/PO ---   -- OTHERS --
VOLSER  DEVTYPE  ADAYS   ADATE    DSNS    TRACKS  DSNS  TRACKS   DSNS  TRACKS
TS0001  3380        30   83365      92     1824    89    1724       3     100
                    60   83335      80     1600    79    1524       1      76
                    90   83305      72     1478    74    1478
                   120   83275      72     1478    74    1478
                   150   83245      72     1478    74    1478
                   180   83215      72     1478    74    1478

                                  TOTAL   TOTAL   -- PS/PO ---   -- OTHERS --
VOLSER  DEVTYPE  ADAYS   ADATE    DSNS    TRACKS  DSNS  TRACKS   DSNS  TRACKS
TOTAL   3380        30   83365    1523    19800  1467   17924      56    1876
                    60   83335    1493    18776  1446   17100      47    1676
                    90   33305    1492    18700  1446   17100      46    1600
                   120   83275    1492    18700  1446   17100      46    160
                   150   83245    1486    18100  1446   17100      30    100
                   180   83215    1486    18100  1446   17100      30    10

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                 TOTAL  --- ALLOCATED ---  -- INCREMENTAL --  ---- SAVINGS ----
VOLSER DEVTYPE  TRACKS  TRACKS  DSNS  PER  TRACKS  DSNS  PER  TRACKS  DSNS  PER
MVSYS1 3380      13275    7359   124  56%    3947    91  30%    3412    33  46%
MVSYS2 3380      13275   11223    97  85%    1634    18  12%    9589    79  86%
TS0001 3350      16650   16125   968  96%    4015    29  24%   12110   939  75%
TS0002 3350      16650   15500   812  93%    3900   150  23%   11600   662  74%

                 TOTAL  --- ALLOCATED ---  -- INCREMENTAL --  ---- SAVINGS ----
VOLSER DEVTYPE  TRACKS  TRACKS  DSNS  PER  TRACKS  DSNS  PER  TRACKS  DSNS  PER
TOTAL  3350      33300   31625  1780  95%    7915   179  24%   23710  1601  75%
TOTAL  3380      26550   18582   221  70%    5581   109  21%   13001   112  70%
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Democrats heap kudos on convention system, networks

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Except for some comparatively minor hitches, the many high-tech systems at work during the 1984 Democratic National Convention reportedly operated pretty much according to plan.

Because of abbreviated installation schedules, a few of the convention's throng of equipment and services suppliers were unable to devote as much time as they had wanted to user training. The result was that delegates and convention personnel, a mostly nontechnical lot, sometimes shunned the systems out of sheer uncertainty over how the gadgetry worked.

For the most part, though, the largest collection of information systems and communications networks in the history of U.S. political conventions acquitted itself quite well, sources agreed.

"We probably experienced less than a quarter of the number of problems we anticipated," said Tim Sammons, head of Berkeley, Calif.-based Sammons & Associates, Inc., a systems consulting firm. As official DP consultant to the convention, Sammons spearheaded the installation of systems and networks that ranged in applications from recording delegate votes to sending electronic mail and from distributing credentials to taking phone messages.

Not every facet of the convention's high-tech operations, however, enjoyed entirely smooth sailing. At the outset, for example, organizers had intended to install some 56K bit/sec phone lines between the Moscone Center convention site and the Democrats' credentials distribution point a few blocks away. The purpose of the lines was to help "trouble desk" personnel inside Moscone to resolve unforeseen problems in verifying and distributing the convention's estimated 100,000 credentials.

Lines never came

But for reasons that have yet to be entirely explained, the requested lines "never came through," according to Sytek, Inc. systems engineer Jeff Wilbur. Sytek supplied the Democrats with a microcomputer-based local network that aided convention organizers in monitoring, verifying and dispensing all the attendees' credentials.

In the absence of the 56K bit/sec lines, the Democrats were forced to opt instead for 4,800 bit/sec cables. But because the Sytek network encompassed only 12 personal computers, and therefore supported a relatively low volume of traffic, the 4,800 bit/sec lines proved adequate, Wilbur said.

A somewhat more significant problem resulted from Sytek's inability to gain ready access to the Moscone Center. "We were unable to get inside the building and install our equipment until just a few days before the convention began," Wilbur recalled.

Thus, time that Sytek might otherwise have spent on user training had to be devoted instead to the pressing problem of getting the credentials network up and running. The resulting cutback on operator training, in turn, may have prevented the network from being used to its fullest capacity.

In theory, the network was supposed to be used for practically all the convention's credentials-related activities. But in practice, automation sometimes took a back seat to manual techniques, except when the credentials-issuing process hit an unforeseen snag, Wilbur said.

"If we had been able to put all our equipment in place three weeks ahead of time and had had a chance to teach our people how to use it, we would probably have gotten a lot more use out of the network," he said.

Similar hitches also characterized an electronic mail system that Burlingame, Calif.-based American Network Services, Inc., installed in 37 area hotels, the Moscone Center itself and other important convention sites. Like the credentials network, American's electronic mail facility encountered no serious technical problems during its four-day reign, but was still used less extensively than its developers had hoped.

"American Network Services wasn't able to gain access to the hotels until the Friday before the convention began," Sammons said. "So most of its resources were tied up just in getting the network installed. The company had originally planned to do a great deal of user training, but it didn't have enough time." The result was that the network was sometimes lightly used because its nontechnical operators were inadequately trained.

Training, however, did not prove to be even a slight handicap for some of the convention's other high-tech services, including the electronic voting system and the automated phone messaging center. Like the rest of the convention's armada of information processing and communications aids, the voting system drew positive reviews from Democratic officials and delegates, according to Scott Lamb, a spokesman for Datapoint Corp., the facility's developer.

At first, Datapoint executives voiced serious doubts about the ability of their systems to withstand the heat of the Moscone Center's crowded convention floor and even considered placing fans next to their disk modules, Lamb said. But the fears soon proved unfounded.

"The people who run the Moscone Center apparently had some additional air conditioning installed immediately prior to the convention," Lamb said. As a further precaution, Datapoint itself equipped the keyboards in its voting systems network with special covers that hid all but the necessary keys and thus prevented delegates from entering incorrect data inadvertently.

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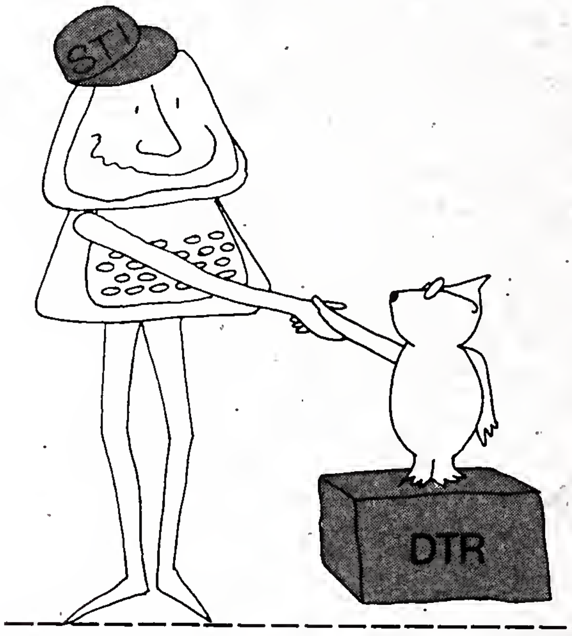

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EEC, IBM seen near resolution

By Tom Henkel
CW Staff

BRUSSELS — A postponed press conference and a series of 11th hour meetings fueled speculation at press time last week that IBM and the Executive Commission of the European Economic Community (EEC) were on the verge of resolving the four-year EEC antitrust investigation of IBM.

The EEC had scheduled Tuesday, July 24, as the day it would decide whether IBM had engaged in unfair competition in the Western European marketplace. But a press conference here to announce that decision was postponed at the last minute, presumably after weekend negotiations brought the two sides closer to a compromise.

The EEC had stated it would decide the IBM case before it adjourns for a summer recess at the end of July. Industry watchers speculated the EEC would make its decision by the end of last week, but at press time, no decision had been announced.

What appeared to be a breakthrough in the case surprised some industry watchers who believed IBM and the EEC were so far from a compromise that the EEC called the July 24 press conference to announce a ruling against IBM. William Easterbrook, who has been following the EEC case for New York-based Kidder, Peabody & Co., said the postponement of the press conference was a clear indication that some progress had been made toward closing that rift between the two sides.

The two most hotly contested issues in the four-year battle, Easterbrook noted, have been IBM's policy of insisting European mainframe users buy initial main memory upgrades from IBM and IBM's policy of not releasing technical information about new products until first deliveries are made. In the latter issue, the EEC wants IBM to release technical details of its products when they are announced.

Jack Hart, an IBM watcher with International Data Corp. in Framingham, Mass., noted that IBM is probably willing to strike a deal on the memory upgrade issue, but will not budge on the issue of releasing details of products prior to delivery.

Hart said IBM memory upgrades are already priced competitively with upgrades available from plug-compatible memory makers. Hence, Hart said, giving up a requirement that users buy initial memory upgrades from IBM would probably not be too painful for IBM.

However, Hart called IBM's policy of holding back technical details on new products a sacred issue within IBM — one that the firm will never relenquish.

Firm to support four IMS copies on lone CPU using MVS/XA

FIRST USER

By Paul Gillin
CW Staff

MONTREAL — For Hydro Quebec, the only electric utility in the Canadian province of Quebec, counting processing pennies is not nearly as important as supporting the four copies of IBM's IMS data base management system (DBMS) that make up the heart of the data center operations.

To handle that load more efficiently, the company became one of the first users of IBM's MVS/XA operating system on an Amdahl Corp. 5860 mainframe. The capability will allow Hydro Quebec to move all four IMS systems to the single mainframe later this year.

Hydro Quebec uses multiple copies of IMS to handle the large on-line demands of its billing, customer service, program development and teleprocessing functions. A different copy of the DBMS is used to support each function.

> *Dupre said he expects the primary advantages of the conversion to come from the cost savings of not having to run two machines and increased speed.*

Until recently, Hydro Quebec's data center ran an IBM 3081 with MVS/XA for batch jobs and two IBM 3033s, each with IBM's MVS/SP and each running two copies of IMS. With more than 3,000 terminals in use at the company, Hydro Quebec was anticipating response-time problems if DP requirements continued to grow at their previous 40% clip, according to Jean-Marie Dupre, technical support group manager.

It became obvious last year that the company would have to move to MVS/XA. The problem lay in the fact that the 3033s that were running IMS could not support XA, Dupre said. "MVS has a 16M-byte maximum of virtual storage in each address space," he said. "With the 3033s, it was not possible to put all our IMS in the same machine with the 16M-byte limit."

After evaluating mainframes from IBM and Amdahl, Hydro Quebec chose the Amdahl 5860 with its XA support capability. Dupre said the company decided to install the Amdahl hardware after it determined that it offered superior price/performance to comparable IBM equipment. By the end of this year, the data center will have replaced its 3033s with a single 32M-byte 5860 running XA. The four copies of IMS will run on a single Amdahl mainframe. Another 5860 with MVS/XA will also be installed.

"With XA and [IBM's Multiple Systems Coupling Feature (MSC)], we hope to be able to handle all of our IMS in the same machine," Dupre said. "XA gives you a 2G-byte virtual storage limit in each address space."

Dupre said he expects the primary advantages of the conversion to come from the cost savings of not having to run two machines and increased speed. "If you use MSC on the same machine, you can use the cross-memory feature," he said. "When one IMS wants to talk to another, it simply addresses core memory. With multiple machines, you have to go channel-to-channel, and that involves an I/O."

The company installed a 5860 and XA in a single weekend beginning Saturday, June 30. Initial program load was done on Monday, July 2, and the system was up and running on Tuesday. "Everything came up the first time, and we went directly into production," Dupre said.

The data center did experience one major problem immediately that resulted in the loss of a communications channel for the rest of the week, Dupre noted. The bug was traced by Amdahl engineers to a microcode problem and was fixed over the weekend.

Hydro Quebec has not calibrated the new system yet, but Dupre said he has noticed that 5860 performance is faster under XA than it was under MVS/SP. More importantly, he said, XA will allow the company to utilize more efficiently its more than 80 IBM 3380 disk drives.

The combination of the new Amdahl hardware and XA capability will also accommodate planned expansion better in IBM TSO usage, Dupre said. Currently, the 5860 accommodates about 220 IBM TSO users at peak times. By the end of the year, Dupre expects that number to climb to 300 or more.

A recently announced Amdahl capability may also enable Hydro Quebec to delay a hardware upgrade next year. Dupre said his company plans to become a first user of a new Amdahl capability that will allow customers to tie two 5860s together to achieve the equivalent performance of the top-of-the-line Amdahl 5880 dual processor.

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2. The books were written under the technical supervision of Paul Noll, a COBOL expert from industry. Paul has been a software specialist and training manager for Pacific Telephone; he's been manager of the COBOL project in GUIDE, a large IBM users' group; and he now consults in COBOL shops throughout the country. As a result, I'm confident this course is without equal in terms of technical excellence.

3. Much of the structured-programming material comes from a book by Paul Noll, *Structured Programming for the COBOL Programmer*. This book is currently used by dozens of businesses for inhouse training. And many companies have adopted its principles as their standard for program development. So I'm sure you'll find the structured-programming content to be practical, helpful, and a real boost to your programming skill and productivity.

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Navy aims for vendor independence with Unix system

CW AT SYNTOPICAN XII

By John Desmond
CW Staff

CHICAGO — After completing the prototype stage of an office automation system development project at the U.S. Naval Surface Weapons Center based in Dahlgren, Va., the system development team found itself with a problem typically experienced by medium-size companies designing OA systems.

"We felt we needed independence from vendors for a long-term solution," said Alan Hynson, a computer scientist with the weapons center who took part in the OA project. "We tended to have a small say-so in company developments. Vendor independence, we feel, is necessary for future evolution."

For the 4,500-employee lab to achieve user independence, the Navy decided that the system it finally chose had to be Unix-based. "Unix is the closest thing there is to a universal operating system for 16- and 32-bit users," Hynson told an audience at the recent Syntopican XII Conference and Exposition here.

Other factors found to be important after the prototype phase were: user friendliness, extreme reliability, protection of sensitive data, integration with multivendor products and system support, Hynson said. Conventional DP support was found to be inadequate, he said, adding, "When users want to use the system, it has to be there and work properly."

> *'Unix is the closest thing there is to a universal operating system for 16- and 32-bit users.'*
> — Alan Hynson, Naval Surface Weapons Center

The Surface Weapons Center is spread out in installations from New Jersey to Florida on the Atlantic Coast and along the Gulf Coast to the Mississippi River. Buildings within the same complex may be several miles apart, Hynson said.

The weapons center's Productivity Enhancement Project Office was assigned in March 1980 to use OA to improve productivity. Prime Computer, Inc. won the contract for the prototype phase, and a Prime 550-II 32-bit CPU with 64 ports was provided. A total of 50 users in two labs 70 miles apart, connected on the Primenet local-area network, were the prototype-phase users.

For the production or final phase of automation, a total of 250 users had to be supported initially, and the system had to be expandable to up to 2,000 users within three years. The Navy decided its communications backbone would be a Sytek, Inc. broadband local-area network.

Computer Consoles, Inc. of Rochester, N.Y., was awarded the contract to supply the final phase of automation with Digital Equipment Corp. VAX-11/780 superminicomputers that would run the Unix operating system. Four VAX-11/780s are now in place, Hynson said.

The weapons center's support staff is composed of 14 people in-house, and the vendor provides support help as well, Hynson noted.

Hidden costs of automation, both in the Navy's case and for private firms, Hynson said, include: site preparation (power and cooling), conversion costs, lower initial productivity (learning curve), retraining, a waiting period of three to six months for the system to become operational after a contract is awarded and employee reluctance to use the system.

Agency to train 700,000 microcomputer, word processing operators

CW AT SYNTOPICAN XII

CHICAGO — A representative from Manpower, Inc. said at the recent Syntopican XII Conference and Exposition here that after a year of experience, the firm's effort to train more than 15,000 of its temporary office employees in word processing has been successful.

The company, said to be the largest in the temporary help field, with worldwide sales in fiscal 1984 exceeding $1 billion for the first time, announced its intention to train 700,000 of its workers in the use of personal computers as well as in word processing.

Manpower has developed its own training program on a diskette, called Skillware, which the company said can train a person to run a personal computer in one day.

The company will also offer training on 12 manufacturers' word processing systems, including: the IBM Displaywriter 5520 and 8100; the Wang Laboratories, Inc. WPS, OIS and Wangwriter systems; the Digital Equipment Corp. Decmate II; the Xerox Corp. 860 and 640; and systems from Raytheon Co. and Lanier Business Products, Inc.

Recent demand for operators

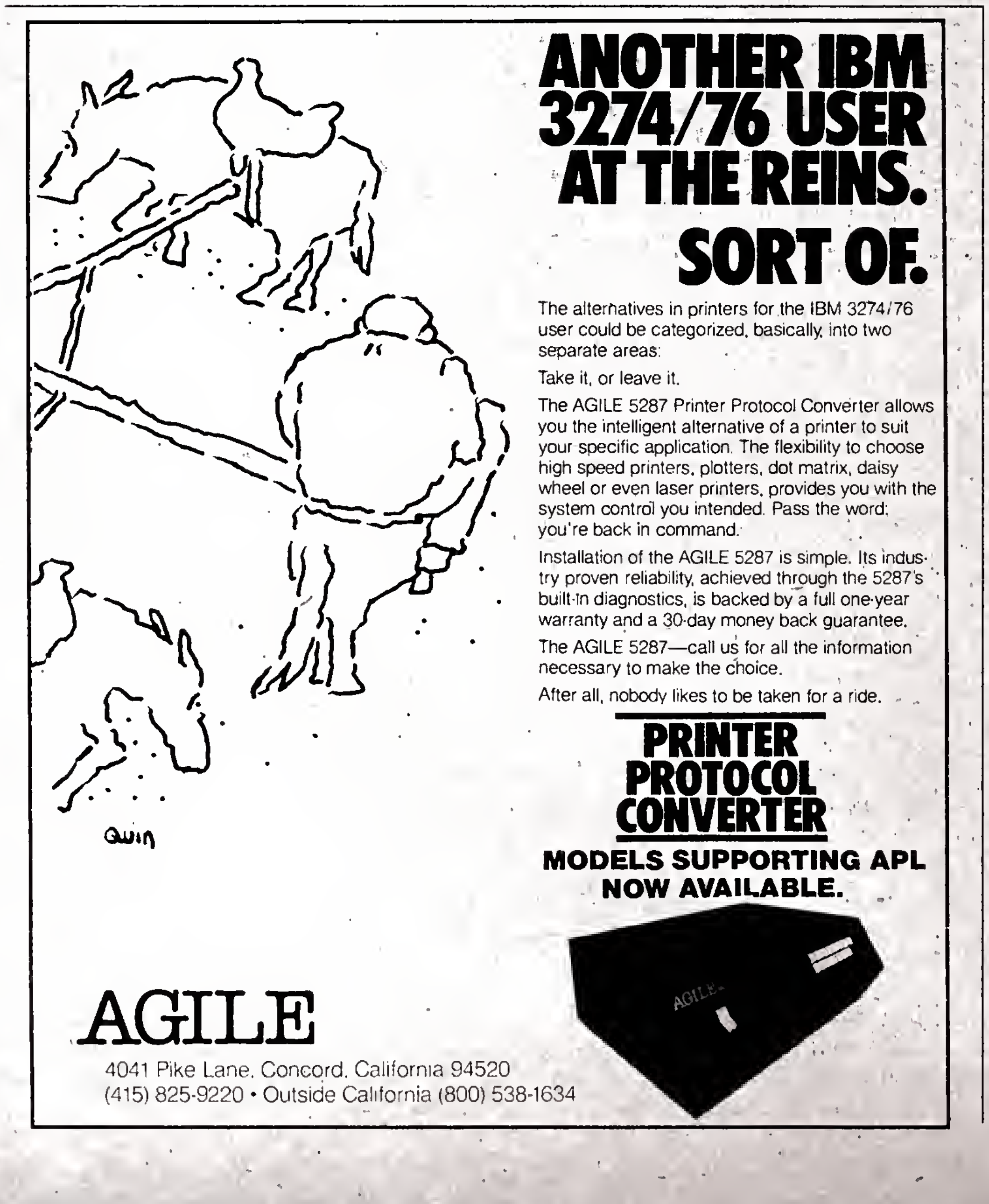
Only in the past three to four years has Manpower had a demand for word processing and personal computer temporary operators, according to Terry Huenke, vice-president of U.S. marketing for Manpower, who spoke at a press conference. Most recently, the company has been getting more requests for personal computer operators, Huenke said.

Manpower President Mitchell S. Fromstein said some 30% of the company's requests for temporary office workers are for word processing or personal computer operators.

He noted that currently in U.S. offices, only one personal computer is installed for every 11 typewriters in place.

Fromstein added that Manpower is equipping all its own offices — 1,050 worldwide and 535 in the U.S. — with IBM Personal Computers.

Some 75% of Manpower's requests for temporary help relate to office work, and the permanent work force is absent an average 8% of working hours, Huenke said in accounting for Manpower's growth.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ICL fights attempted takeover

LONDON — In a surprise development here late last week, ICL Ltd., the largest British computer manufacturer, advised its shareholders to stand pat following what has been described as a hostile takeover bid by Standard Telephone and Cable (STC), a British company in which ITT reportedly holds a 30% share.

Last Wednesday night, July 25, ICL shares closed on the London stock exchange at 83 cents per share, after trading partway through the day at a record low of 71 cents per share.

On Thursday morning, the stock opened at $1.05 per share when it was revealed that an unidentified party had made what was described as an overnight raid on the stock.

Shortly after the London stock exchange opened last Thursday, Britain's STC revealed it had purchased about 10% of ICL's outstanding shares and was making a formal takeover bid for the remaining shares.

Reportedly, STC is offering two shares of STC for seven shares of ICL, amounting to a total cash deal in the neighborhood of $500 million.

Sir Kenneth Corfield, head of STC, reportedly denied the takeover attempt was a hostile one.

Other suitors

ICL advised its shareholders not to take any action because other suitors were anticipated, although none were mentioned. Speculation in the UK was that cash-rich General Electric Ltd., not associated with General Electric Co. in the U.S., would make a bid for the company.

In another development, not necessarily related, the London office of AT&T International advised members of the British media that it had scheduled a press conference in London this morning to make a joint announcement with "a major British company."

At press time last week, officials at AT&T and AT&T International in the U.S. said they had no knowledge of any announcement.

OA entry forces firm's DP shop to shape up support

Executives' entry onto system seen as motivation behind services improvement

CW AT SYNTOPICAN XII

By John Desmond
CW Staff

CHICAGO — When top company executives finally got on the office automation system at Lockheed Missile and Space Co. in Sunnyvale, Calif., in June — a year and a half after the system was available to them — staffers in the DP shop had to shape up their support services.

It was only then that the DP shop was motivated to do so, Marion Evison, a computer systems specialist at Lockheed, told a seminar at the Syntopican XII Conference and Exposition here recently.

Evison, who was on the team that helped bring integrated office information to Lockheed, said the top executives got turned on to the company's emerging OA system at an early Monday morning meeting in the Sunnyvale corporate headquarters. The executives who happened to be on the company's network, IBM's Professional Office System (Prof), had a copy of Lockheed's Friday activity report, while the executive from corporate headquarters was to receive his by company mail — probably on Tuesday or Wednesday.

"They were never interested until that point," Evison said of the top brass. The upshot for DP was significant, since the top executives would now be calling on the DP shop for support. "When you have the executive vice-president on the system, you [have to make sure somebody is] there to answer the phone," Evison said of the DP shop.

> *At a Monday meeting, the executives who were on the company's office automation network had a copy of Lockheed's activity report from the previous Friday, while the executive from corporate headquarters was expecting his via company mail Tuesday or Wednesday.*

Lockheed's OA effort began four years ago, and there are now 1,000 terminals in place, Evison said. The effort began as a project in the Information Services Organization, which handles Lockheed's companywide and scientific DP services. The planners wanted the system to create documents, send mail electronically, schedule, do spreadsheets and allow creation of personal files.

"The idea was that one system should offer as many of these features as possible," Evison said. 'We did not want to buy a large number of packages and put them all together."

Lockheed decided on IBM's menu-driven Prof software. "At that time, just over three years ago, Prof had the widest range of capabilities and the most potential," Evison said. The program allowed the company to keep the 2,000 terminals it had in place as well.

In the preprototype phase, begun in March 1982, eight users were brought on. In the prototype phase, begun in October 1982 and carried to November 1983, nearly 50 users were brought on. "At this point, we had a tremendous demand for the system," Evison said, but the team made it difficult for demand to be satisfied. "People had to go through all sorts of approvals," she said.

IBM 3279 color terminals were used, along with an IBM 3287 dot matrix printer, an IBM 7436 letter-quality printer and an IBM 6670 laser printer running on the VM/CMS operating system. The company continually upgraded mainframes as the system grew, going from an IBM 4331 to an IBM 4341 to an IBM 3033 and finally to an IBM 3083 with 16M bytes of main memory, Evison said.

When terminals were made available throughout the company, they were added at the rate of 80 per month, Evison said. Despite a rigorous approval process, 53 of the company's 1,000 users "crept on by getting approval from an authority higher than us," Evison said.

The system averages less than 200 users at one time, and at peak times, the system is strained, Evison said.

She noted that as Lockheed's IBM OA network has grown, so has its Wang Laboratories, Inc. word processing system. "We're waiting for Wang to come up with some software so we can get our Wang documents onto Profs," Evison said. The wait may be a long one, she noted.

Lockheed's long-term OA goal, Evison said, is to get gateway hardware and software to connect its Wang, Digital Equipment Corp. and IBM equipment together. She did not give a timetable for reaching the goal, saying only that it is "very long-range."

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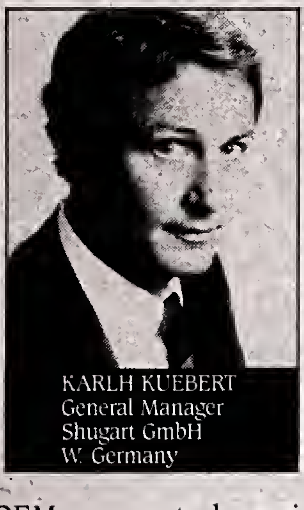

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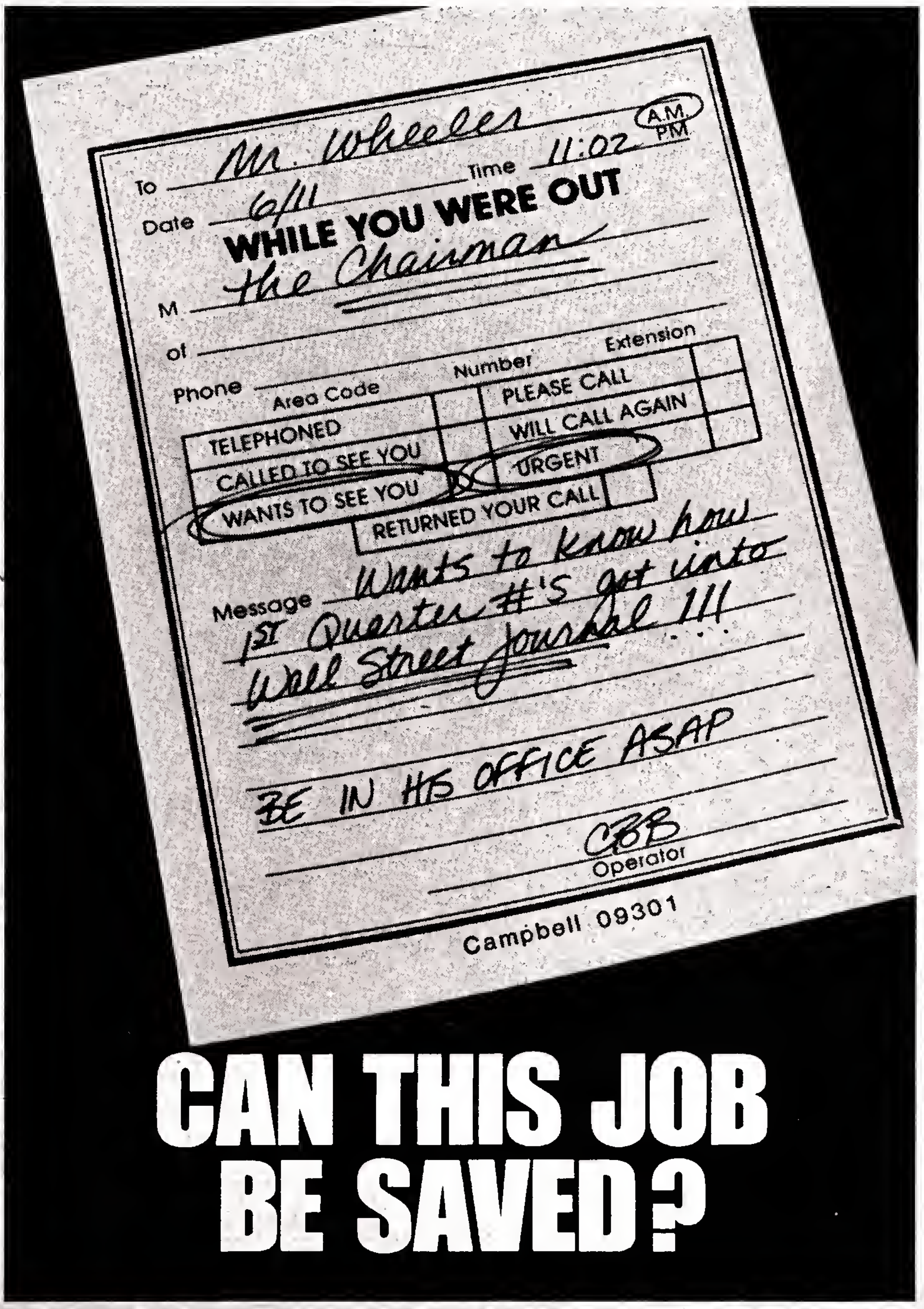

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CAN THIS JOB BE SAVED?

Micro revolution seen spurring MIS involvement in OA

CW AT SYNTOPICAN XII

By John Desmond
CW Staff

CHICAGO — "The personal computer revolution has sparked the involvement of MIS in office automation. Before that, they just stuck their heads in the sand," Randy J. Goldfield declared to an audience at the recent Syntopican XII Conference and Exposition here.

Goldfield, president of the New York-based Omni Group, referred to the syndrome as "MIS malaise." She credited MIS workers with making some progress. "Something of a war is just now beginning to be resolved," she said. But, she added, "MIS remains reluctant to distribute the information processing load."

Goldfield said she had recently completed an extensive survey for a group of major clients on the use of personal computers in Fortune 500 firms as well as in medium and small companies. A total of 834 people, characterized by Goldfield as office automation decision makers, were interviewed for the study.

"What we found is the OA industry is surprisingly mature, and personal computers are a big part of that," she said. Goldfield predicted that personal computers will capture 34% of the OA market by 1986.

In noting some of the roadblocks to the micros making headway in business, Goldfield cited factors keeping MIS "shackled to the past." They included: working only in a mainframe environment, thinking of traditional project life cycles, programming in Cobol, using batch reporting and being influenced by the politics of control.

A normal MIS environment has a 22-month backlog for programming and probably a "ghost backlog" from users who are not bothering to make requests, she said. Frustrated users in such an office typically band together and get a few micros on their own, and personal computer chaos often ensues.

A total of 465 Apple Computer, Inc. micros were installed in one of Goldfield's client companies in Cleveland, and none of them had appeared on any manager's budget. To introduce micros to the workplace properly, Goldfield recommended central purchasing, micro policies on approved vendors and cost justification and total integration with MIS.

Such a strategy can result in greater satisfaction for all concerned, Goldfield said. MIS would have a decreased application backlog and could pay more attention to major jobs. The micro users would have more timely and accurate information, would be insulated from mainframe crashes and would have more involvement in information systems planning, Goldfield said.

However, she cited a number of remaining obstacles, including data base chaos, communications breakdowns and data security.

Other obstacles to introduction of micros in the workplace are cyberphobia — the fear of machines — and cyberphilia — the love of machines — Goldfield said.

Fears can encompass fear of job loss, of improper use of the equipment, of decreased productivity or of not being able to use the system creatively.

The cyberphiliac, on the other hand, typically overspends for new systems and does unnecessary work with it, often producing what Goldfield called electronic junk mail. The machine lover, or computer jockey, can also foster divisive tendencies in the work force.

Another danger is the "Snoopy syndrome," in which employees spend company time making X's and O's into recognizable illustrations and engage in other unproductive acts.

Has the "chaotic growth" and "option shock" of personal computers actually stalled the progress of OA? "Have the 51 IBM look-alikes and the 72 other products made people so frightened that it will make OA harder to implement than before?" Goldfield asked.

The answer is yes, due to a lack of standards among senior executives hesitant to use micros and the "new" cost-justification attitude that the micros will pay for themselves eventually, Goldfield said.

Another of Goldfield's clients, a soft drink bottling company executive in Atlanta, insisted that his secretary rekey computer printouts on a typewriter because he didn't like to read the printout characters. "People aren't comfortable with this yet," Goldfield said of emerging technology.

Companies in which management mandates that integrating micros is a critical issue, in which someone is responsible for overseeing the OA changes and in which management is willing to overhaul policies will be companies that "achieve the benefits of OA without the pitfalls," Goldfield said.

Tactics being successfully employed to control the personal computer influx include in-house computer stores and clubs and corporate computer literacy programs, she said.

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What background typifies your firm's OA specialists?

A man-on-the-street interview at Syntopican XII by CW staff writer John Desmond

***Alan W. Jackson,* administrator of marketing systems in the government services marketing division, RCA Service Co. of Cherry Hill, N.J.:**

"They generally come from the DP side of the house. [Office automation] specialists are very new at RCA. Only this year have we set up a dedicated specialist. And that person's background is DP."

***Leo A. Duclos,* manager of biometrics and data systems, Pfizer, Inc., a drug development firm in Terre Haute, Ind.:**

"Most of them really come from secretarial schools. I don't think they get sufficient training there, but we take it from there.

Pfizer is very big on in-house training. We also send some people to Digital Equipment Corp. and IBM training schools. Our specialists have probably had a little specialized training at a university."

***Eric Sandwall,* senior systems technologist, BASF Wyandote Corp., a chemical company located in Parsippany, N.J.:**

"Right now, I'm the only one involved on a full-time basis, and my background has been in DP for the past 20 years. I saw a need for this in our company, and my boss was open so we created the position. We're now setting up committees to involve more MIS people and word processing people, to try to tie it together in a cohesive architecture."

***Lyndall Maxwell,* consultant with Maxwell Word Processing Services of Houston, which helps small companies automate their offices:**

"Most OA specialists, in my observation, are people who have been with the company a long time, or people with DP background or people with a management background. They are often 'big deal' people with long office management background. In a little company, say with a few lawyers, I think the office manager may hire a consultant and they'll all make decisions together."

***Jess Weaver,* systems coordinator for the General Council of the Assemblies of God church in Springfield, Mo.:**

"Our secretaries are being trained in word processing. DP is a separate entity. We're just starting to set up distributed processing with satellite workstations. The word processing people are handling the satellite setup. I think the OA people should come from a less technical background. We're looking to set up some administrative support teams, people who can be specialists in their fields. Our fields include foreign missions, home missions, youth programs, men's and women's programs and periodicals printing."

***Mark Murray,* administrative manager, Fireman's Fund, a property casualty insurance company in Chicago:**

"I think the OA specialists should come mostly from the technical side, but we also look for input from the administrative side. My company is just getting started. We've had word processing for a few years, but when you start talking 'office of the future,' we're just getting started. We need the people from the DP side to work on bringing OA into the office; some 80% of our business is done on computers."

***Darwin J. Marquardt,* director of administrative operations, Environment Canada, a government department in Ottawa:**

"We're trying to develop OA specialists from the general management side. The people should be familiar with office processes, with what has to be accomplished. We're also trying to bring along the DP people to be more generalists than specialists. I really have to sell to two groups.

The DP people right now are not providing users with automated processes that do real work. The transition between thinking of data processing to thinking of office systems processing is still in the developmental stage. I'm a catalyst in the management group. Companies must have people who can talk both languages."

***Norman C. Keyt,* chief deputy, Maricopa County Attorney's Office in Phoenix:**

"We have an OA specialist who came up through the ranks. She's been a user and a trainer, and we sent her to school; she's a home-grown product. The director of support services, whom she reports to, has a DP background. You need somebody who's a user and knows what users need. And when you're talking about an environment with personal computers and two different manufacturers' 32-bit superminicomputers, we need a DP man to handle the systems-level communications."

***Myrna J. Basar,* office systems analyst, Office Automation-Detriot, Detroit Diesel Allison, a division of General Motors Corp., Detroit:**

"Within our group, one person came from systems and programming, one from manufacturing and industrial engineering and one from the secretarial pool. It's definitely a mixture. It was initially thought of as a systems and programming area, then it was modified.

Our group is not only involved in OA, but in end-user computing, technical implementation and networking. What makes a good OA specialist is the person. It's nothing you can book-learn anyway. It's really on-the-job training and knowing who to contact to help with a certain piece of the pie you're working on."

Gould, Paradyne announce gains in second-quarter profits, revenues

Gould, Inc. last week announced second-quarter profits from continuing operations increased 19.4%, and revenues increased 17.4% over the comparable period a year ago.

Also recording a second-quarter profit, compared with a year-earlier loss and a 45% revenue increase over the previous year, was Paradyne Corp.

Gould profits for the quarter ended June 30 were $22.8 million, or 50 cents per share, compared with $19.1 million, or 42 cents per share, in the year-earlier period. Revenues for the recent quarter were $392.5 million, compared with $334.2 million in the earlier period.

Profits for the quarter, according to Gould's chairman and chief executive officer, William T. Ylvisaker, included an $8.9 million pretax gain associated with the establishment of a semiconductor joint venture in Japan and also a $2.2 million net gain on a stock-for-debt exchange.

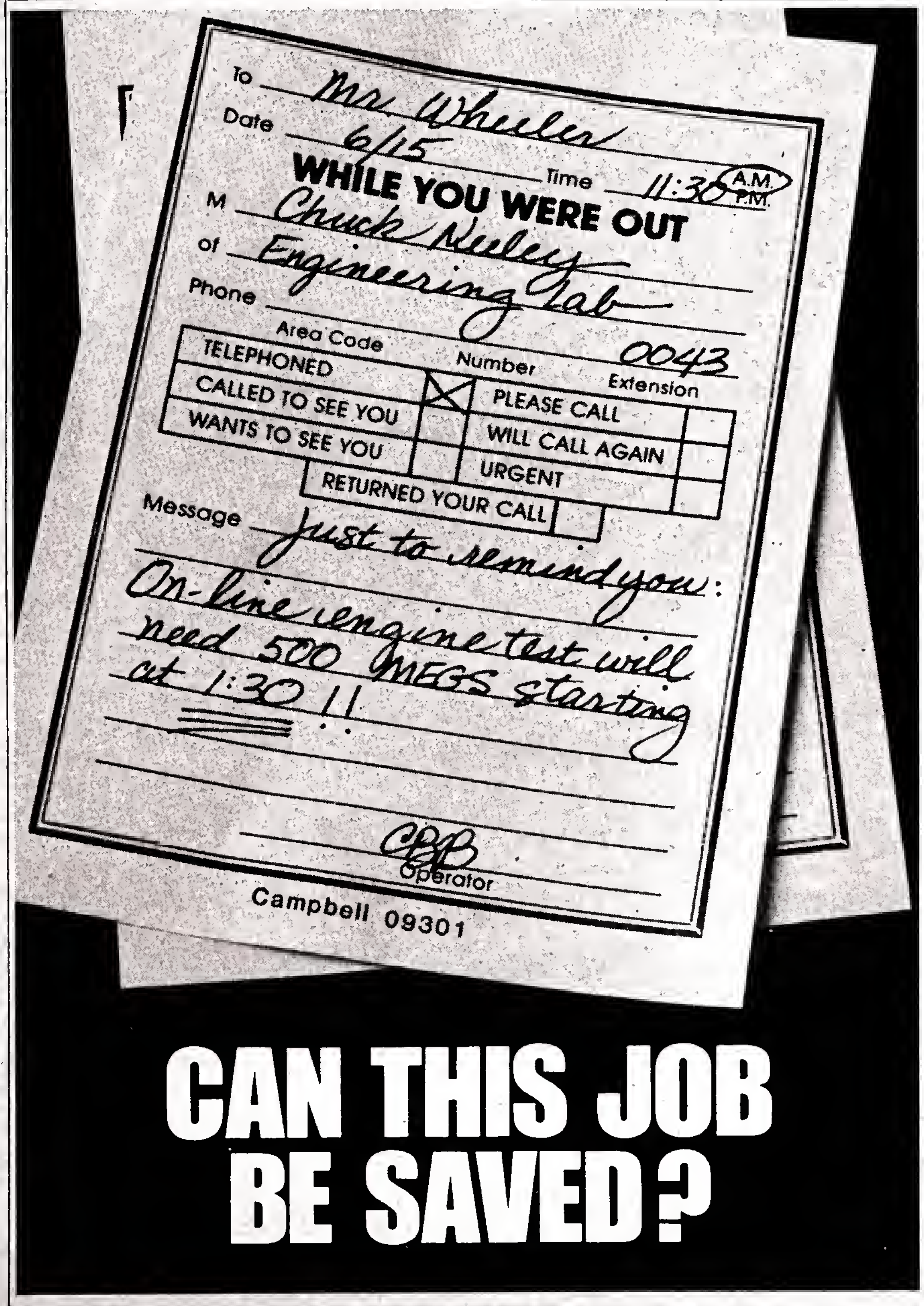
Without those other items, "second-quarter results reflect a very substantial increase in operating earnings in the second quarter," Ylvisaker said.

Sales and earnings from Gould's electronic systems section showed a significant percentage gain, Ylvisaker said.

Paradyne posted second-quarter revenues of $70.5 million, up from $48.5 million in the year-earlier period. Profit for the quarter was $2.3 million, or 11 cents per share, compared with a loss of $929,000, or 4 cents per share, a year earlier.

Paradyne's chief executive officer, Robert S. Wiggins, said orders from both domestic and international operations showed significant increase over the first quarter.

"I continue to be encouraged by the current direction of our business," he said.



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CAN THIS JOB BE SAVED?

Students not learning technical skills for jobs of future: exec

CW AT SYNTOPICAN XII

By John Desmond
CW Staff

CHICAGO — During an anecdote-spiced and boisterous keynote address ranging from problems in education to the robotics market, Dr. Marvin J. Cetron told his Syntopican XII Conference and Exposition audience at McCormick Place here recently that pay for schoolteachers should be raised by 20% across the board and 40% overall for math and science instructors.

The president of Forecasting International, Ltd. of Arlington, Va., and the author of *Jobs for the Future: 500 Jobs, Where They'll Be and How to Get Them*, Cetron said: "Our scarcest resource is kids, and we're blowing it."

Education is not preparing students for the jobs of tomorrow, jobs that the U.S. government may not even be currently listing as occupational titles, he said.

Cetron's firm has forecast the following job titles and number of workers, respectively, by the year 2004: telemarketing, 8 million; computer-aided design and manufacturing, 1.2 million; and software writers, 1 million. Jobs forecast as growing by 1990, by title and percentage of growth, included: data processing and machine mechanics, 157%; computer systems analysts, 112.4%; computer operators, 91.7%; office machine service technicians, 86.7%; and computer programmers, 77.2%.

While 26% of the work force is involved in manufacturing today, only 8% to 11% is projected to be in manufacturing by 1990, Cetron said. However, he projected that the service sector, which employs 68% of the work force today, will grow to 88% of the work force by the year 2000. Of that total, 44% would be in the information industry and 22% will be working at home, he said.

In a warning to his audience at Syntopican, which is sponsored by the Association of Information Systems Professionals (formerly the International Information/Word Processing Association), Cetron predicted that one-third of all secretaries and typists employed today will lose their jobs by 1990, due to efficiencies brought on by office automation. "We're in for some major changes, and most of our people aren't even aware of what's going on," Cetron said.

Where will these workers go? Many of them will acquire qualifications for the growing information industry occupations, many of which require only one to two years of training, Cetron said. Why will so many workers be lost? Cetron cited robotics as a major factor.

"One robot can replace six workers" if the robot works around the clock, the speaker said. And the price of robots is coming down, from an average of $150,000 per robot in 1980 to $102,000 in 1982 to a projected $35,000 in 1985 and to a projected $5,000 in 1990, Cetron said.

He quoted Robot Institute of America figures stating that 6,200 industrial robots are at work today in the U.S., with 200,000 projected to be in place by 1990 and over 1 million by 2004. Automobiles built by robots are said to be nine times better than the best cars produced in the U.S., and robots produce scrap at the rate of 1% while auto workers produce scrap at a 15% rate, Cetron said.

Computer literacy will become as important as driving a car, Cetron said, relating education to the changing job market. Whereas $1 billion will be spent on textbooks in the next two years, $1 billion is projected to be spent on computer-assisted education by 1990, he said. Schools cannot buy more than one-third of the computers they need, he said.

He recommended that educators tap the federal Job Training Partnership Act, intended to aid the unemployed, to get government aid for computers. The unemployed could be trained from 4 p.m. to midnight, while the students learn during the day, Cetron suggested.

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TELECOM BRIEFS

Western Union cuts long-distance prices

WASHINGTON, D.C. — Savings of "up to 25%" were promised by Western Union earlier this month when it announced new rates for its long-distance telephone service, which competes with AT&T's Message Toll Service and Wats offerings.

Scheduled to become effective tomorrow unless the Federal Communications Commission objects, the new tariff features rates for calls of two or more minutes which "we believe are among the lowest in the industry," said Philip C. Richards, Western Union assistant vice-president. Also, for monthly usage of more than 100 hours from any given city, the subscriber receives a 20% discount.

Meanwhile, ITT has promised "major changes" in its switched voice-grade services. Discounts for high-volume callers and elimination of monthly service charges will be announced within the next few weeks, the firm said. ITT also said that it has sold and leased back part of its microwave net, apparently to obtain cash for network improvements.

U.S.- USSR hot line to get high-speed fax

WASHINGTON, D.C. — High-speed digital facsimile terminals will be added to the "hot line" connecting Washington, D.C., and Moscow, the U.S. State Department announced July 18.

A spokesman at the Pentagon, where the U. S. terminal is located, said it is "hoped" the facsimile equipment can be put into operation within two years. U.S.- and European-made terminals are now being evaluated.

Presently, the terminals attached to the hot line — officially known as the Direct Communications Link — are 67 word/min teletypewriters. Dual messages are sent — one via an Intelsat geostationary satellite, the other via the Soviet Molniya low-orbit satellite system. A trans-Atlantic cable connection is kept on standby.

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Dennison Help Center key to system problem-solving

By Donna Raimondi
CW Staff

FRAMINGHAM, Mass. — Cindy Durkee answered the Dennison Manufacturing Co. Help Line phone for the 10th time in as many minutes and heard a familiar complaint.

"My terminal's blank. What can I do?" the voice on the other end said.

Durkee, a Help area coordinator for Dennison, inquired to ensure that the terminal was plugged in and the intensity knob turned up. She then asked the caller if he had access to another workstation. In this case, he did not, so a terminal maintenance man was sent out within two hours to replace the broken equipment.

This call was one of 48,647 received by the Help Line since its inception one year ago. Of that number, Gary Lee Kelley, manager of User Services, has determined that 8,663 were real problems. User questions ranged from nonproblems like "Where can I locate paper for the printer?" to serious concerns, such as remote users' inability to connect via the telecommunications lines. All but 43 of these problems have been solved.

The genesis of the Help Line began about a year ago, when Kelley and the managers of Information Systems Operations, Applications Development and Technical Services and Operations departments for this multimillion-dollar maker of office supplies realized that trouble was brewing. A new IBM 3033, supporting three operating systems (VM, MVS and DOS), had been delivered [CW, Jan. 17, 1983], and the user community had grown from 85 to 450 people.

Grumblings emanated from users who had contacted two or three people about their new problems and were given a pass-the-buck answer. The managers decided that a central point for coordinating and tracking problems was needed. Thus, the Help Center was born.

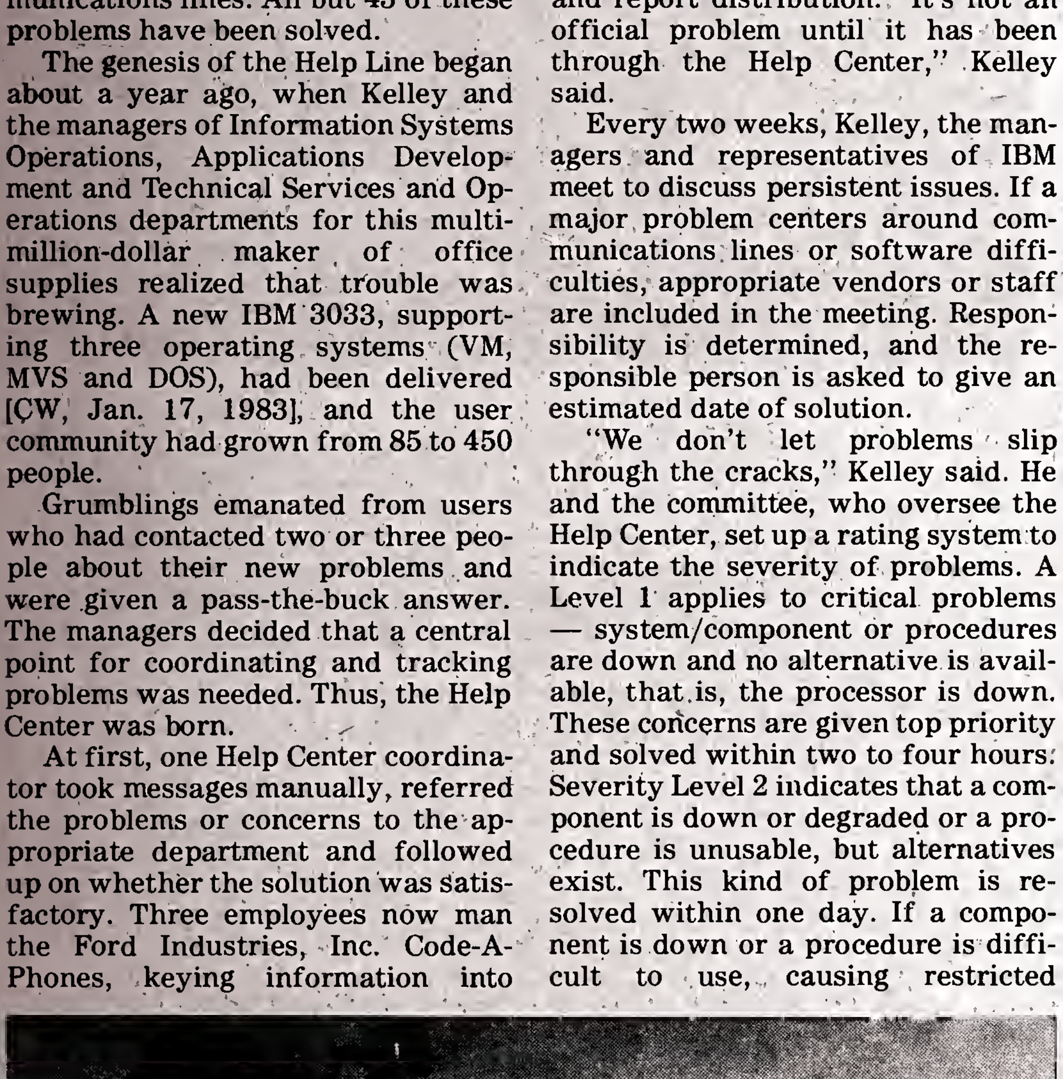
At first, one Help Center coordinator took messages manually, referred the problems or concerns to the appropriate department and followed up on whether the solution was satisfactory. Three employees now man the Ford Industries, Inc. Code-A-Phones, keying information into IBM's Information/Management data base via IBM 3178 terminals. Kelley estimates that the Help Center staff solves user problems 75% of the time without further reference.

A fourth person is responsible for maintaining a terminal pool so he can respond quickly to terminal problems. The staff always follows up to ensure that Kelley's dictum, "The most important function of the Help Center is to maintain user satisfaction," is met.

On nights and weekends, recorded messages instruct users to determine if their need is critical or not. If critical, users relate their message after the first beep, if noncritical, after the third beep. If critical, a Command Communications, Inc. auto signaling and paging device dials Help Center employees' beepers so they can, from wherever they are, locate the proper solution. A daily log, jokingly referred to as "the globe" because of its size, reflects the current status of problems in 10 categories, such as hardware, software, network, documentation and report distribution. "It's not an official problem until it has been through the Help Center," Kelley said.

Every two weeks, Kelley, the managers and representatives of IBM meet to discuss persistent issues. If a major problem centers around communications lines or software difficulties, appropriate vendors or staff are included in the meeting. Responsibility is determined, and the responsible person is asked to give an estimated date of solution.

"We don't let problems slip through the cracks," Kelley said. He and the committee, who oversee the Help Center, set up a rating system to indicate the severity of problems. A Level 1 applies to critical problems — system/component or procedures are down and no alternative is available, that is, the processor is down. These concerns are given top priority and solved within two to four hours. Severity Level 2 indicates that a component is down or degraded or a procedure is unusable, but alternatives exist. This kind of problem is resolved within one day. If a component is down or a procedure is difficult to use, causing restricted function, a Level 3 rating is applied, and problem-fixers are given four days to straighten it out. When a problem does not hamper operations or functionality, a Level 4 means resolution will happen as time permits.


Cindy Durkee at the Help Center.

Gary L. Kelley at the Help Center station.

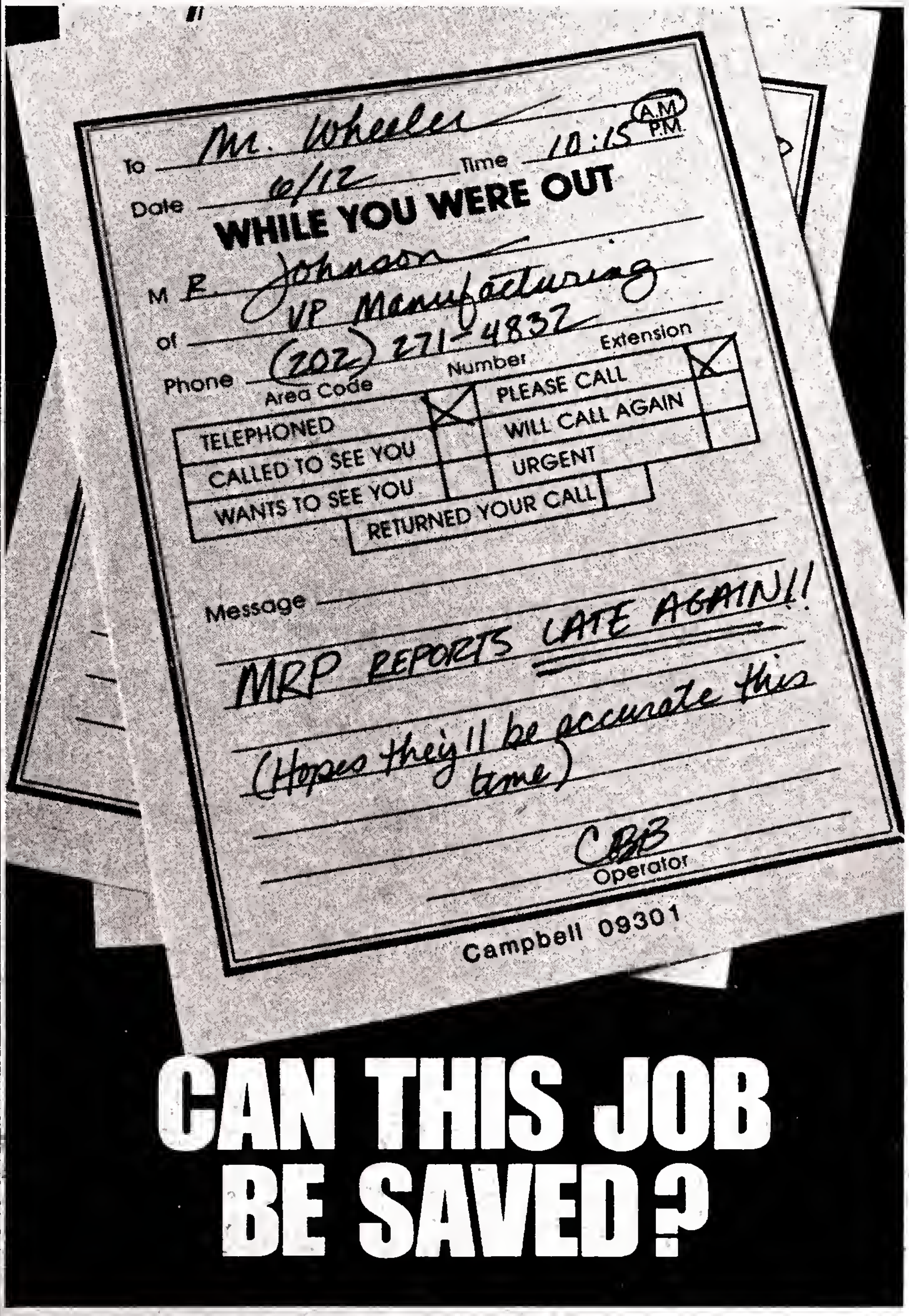
CW photos by D. Raimondi

"I can't imagine things today without a Help Line," Kelley said, adding that the Help Center saves Dennison money by dealing with people at all levels to increase productivity. But there have also been unexpected benefits. DP personnel feel relieved of the pressure of dealing directly with angry users, and users are warming up to Help Center staff because they feel they know them after several contacts, Kelly said.

In response to the most frequently asked questions on the Help Line, the MIS department issued the "MIS User Guide" containing information on the department's organization, Help Center functions, instructions for logging on and off, operating terminals and other common concerns.

The Help Center has had an effect on vendors, too. In one instance, IBM's Passthru software, which enables users to go between the three operating systems without logging on each time, was causing long wait situations that prompted lots of calls about poor response. IBM and Dennison discussed the issue at length, and IBM came up with a fix.

Users' reports about one of Dennison's communications lines allowed the DP managers to provide overwhelming documentation to support a decision to get rid of one company's line and install another's line.



CAN THIS JOB BE SAVED?

U.S., allies restrict technological exports to Eastern bloc

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The U.S. has persuaded its Western allies and Japan to place export restrictions on superminis, software distribution packages, high-performance personal computers and telecommunications switching systems to the Eastern bloc countries.

The agreement reached in Paris this month capped months of negotiations between the U.S., which advocated stricter controls over new computers and software technologies, and the Europeans and Japanese, who favored a more lenient approach, arguing that the technology can be obtained almost anywhere on the globe.

However, the Paris-based Coordinating Committee for National Strategic Embargoes (Cocom), comprising 15 member countries, did liberalize export treatment for commercially available off-the-shelf personal computers in the 8-bit and 16-bit model range, providing they have not been ruggedized for military use. This past spring, U.S. defense officials testified before the U.S. Congress that Apple Computer, Inc.'s Apple IIs, 8-bit machines, were being used in coordinating nuclear targeting functions.

The U.S. has led the way in pushing for controls over Western technology exports to the Eastern bloc, asserting that the new military strategies are inextricably tied to computers, software and telecommunications for management control.

The recent Cocom agreement is the first extensive revision of the critically important Military Technologies List since it was created in 1976. U.S. computer industry representatives have been urging the U.S. to liberalize the Cocom review of exports. Lobbying intensified after the U.S. Department of Defense succeeded in its efforts to gain limited review of exports of high-technology items to Western countries where diversions of sensitive technology to the Eastern bloc had taken place.

The U.S. computer industry has argued that its foreign sales are being hampered by the government review process in the U.S. Digital Equipment Corp., for example, is known to have suffered from export approval delays.

In the latest revisions to the restricted export list, Cocom did not specify exactly which computers it will prohibit from reaching Eastern bloc countries. It only set out the parameters for which technology could and could not be exported without Cocom license review.

At a press briefing here last week, Richard Perle, assistant secretary of Defense, outlined the "threshhold" limits of computers that would not be approved for export to the Eastern bloc. The parameters included ruggedized computers, superminicomputers with .5G byte of virtual memory, all computers with a processing data rate of 48M bit/sec or faster, all upgrades to Eastern bloc manufactured systems, large bubble memory storage devices, technology for the manufacture of any computers and computers used to design microelectronic systems for computers.

In the technology area, Cocom agreed to place controls for the first time on the development or production of computers or software systems, even if the computers or software are not currently embargoed from export. Additionally, it placed controls on computers integrated into other equipment.

In the software area, Cocom placed under control for the first time software applications systems with military applications, distributed data base management systems, on-line transaction processing, software for cross-hosted computers, newly developed software that might have military or strategic value, software development systems, computer-aided design and manufacturing systems, multilevel security software systems, signal processing, image enhancement, networking and artificial intelligence systems and cryptoanalysis.

Finally, telecommunications switching systems were "substantially tightened" by Cocom for Eastern bloc export. The new regime provided relaxation of controls for low-end, older office systems equipment, but also added strict controls over digital-switched systems and placed a four-year moratorium on all terminal and transit switches used in networks. works.

Conference to focus on DDS software

CHICAGO — A conference titled "Software Tools for Distributed Decision Support Systems" will be held Oct. 22-23 at the Hyatt Regency Hotel here and on Oct. 29-30 at the Westin St. Francis Hotel in San Francisco.

The conference will focus on management issues in the evaluation and selection of software tools for development of distributed decision support (DDS) systems.

The keynote speakers will address the issues involved in getting started, getting control of and getting value from DDS. In Chicago, the keynote speakers will be Peter Keen of Informational Technology Services, Inc. and Nolan, Norton & Co. and Gary Gulden of Index Systems, Inc. In San Francisco, the keynote speakers will be Michael Treacy of the MIT Center for Information Systems Research and Adam Crescenzi of Index Systems.

Panelists and speakers will describe organizational and technical interfaces between end-user computing and the data processing establishment, plus strategic policies for microcomputers, data access and telecommunications.

A panel discussion each day, chaired by keynote speakers, will include four user-developers.

Twelve software vendors will discuss their product strategies and also demonstrate and discuss specific applications.

Additional information may be received from Prof. Warren Briggs, Software Tools Conference, Suffolk University, Boston, Mass. 02108.

IBM Security Techniques Revealed

The proliferation of IBM systems is a phenomenon of business today. As the importance and capabilities of IBM continue to increase, it is becoming crucial to be able to attain complete control and utilization of the system. So, for the fourth year in a row, one of the nation's leading independent authorities on IBM auditability, MIS Training Institute, Inc. is holding its comprehensive conference on IBM systems. Entitled The 4th Annual Conference on Control, Audit & Security of IBM Systems, the four day event comprises a series of tutorials, mini-tutorials, consultations and presentations. The conference is designed to meet the needs of all professionals interested in achieving optimum security of their IBM's. This year's subjects will run the gamut from MVS (including XA), to CICS, IMS, SNA and VM. In addition, such topics as RACF, ACF-2, PC to mainframe communications, SAS/SMF interface, SYSLOG, SMF Exits, DOS/VSE, PC/370 and 3270-PC. Encryption, FOCUS and OS Utility tricks will be explored.

Recognized across the nation as the definitive conference on these matters, attendance has increased annually and promises to reach capacity again this year. The session takes place October 1-4, 1984 at the Drake Hotel in Chicago, Illinois.

For more information, call or write MIS Training Institute, Inc., 4 Brewster Roa Framingham, MA 01701, (617) 879-7999.

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- 20 Finance/Insurance/Real Estate
- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government—State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User ______________

Vendors
- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor ______________

2. **OCCUPATION/FUNCTION (Circle One)**
- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Services
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other ______________

3. **COMPUTER INVOLVEMENT (Circle all that apply)**

Types of equipment with which you are personally involved either as user, vendor or consultant
- **A.** Mainframes/Superminis
- **B.** Minicomputers/Small Business Computers
- **C.** Microcomputers/Desktops
- **D.** Communications Systems
- **E.** Office Automation Systems

CW-138

Study finds MIS departments lagging behind technology

FRAMINGHAM, Mass. — While MIS organizations in large U.S. businesses are indeed changing, they have not yet caught up with the technology around them, according to a recently published study.

The study by International Data Corp. (IDC), a market research firm based here, examined the organizational structure of 60 MIS departments at mostly Fortune 500 companies. It examined how companies are organizing in five areas: telecommunications, computer operations, information centers, programming and user support.

The 1983 survey found that there have been few major changes in the organizational structures of MIS departments since a similar 1980 study. But the recent report showed that MIS departments now are more likely to provide support and technical services for office automation, the information center and telecommunications areas.

The study found that most of the companies surveyed have an office automation function and that most of those — 89% — are managed by MIS. Similarly, most companies also had a specifically assigned telecommunications function, 82% of which are under the wing of MIS.

Information centers were not as common among the companies as office automation or telecommunications. Only 58% of the companies had an information center, while another 10% had plans for one.

Nearly all the MIS respondents said they expect to increase purchases of commercial software packages. This result was not surprising, the study stated, because of growing backlogs for MIS and user application development.

In the area of personnel changes, the study found that most MIS managers already see, or expect to see, changes in the types of their employees.

"Across all types of businesses," the study stated, "MIS managers face very similar problems and pressures. Managers who are building and running information systems may have more in common with their counterparts in an entirely different business than with other departments of the same company."

One of the principal concerns cited by MIS managers involved microcomputers. "Managers were concerned about what [micros'] impact will be, how to introduce them into user departments, how to manage them and how to productively use them," the survey stated.

Other areas of concern involved personnel, office automation and information centers, communications and distributed processing integration and general issues of management and control of MIS, the study said.

In questions related to support for the MIS department among corporate management, the study concluded that:

- ■ While 75% of the companies have an MIS executive steering committee, the mere existence of such a panel does not necessarily benefit the MIS department. More important are the types of people on the committee and their amount of involvement.
- ■ The complexities of operating an MIS department are prompting more companies to devote more resources to long-range planning for MIS.
- ■ The use of a separate committee with authority on computer buying decisions has advantages over the MIS division taking total responsibility.
- ■ MIS executives place more importance on the involvement and support of senior executives than on steering committees, status reports and other management aids.

The average MIS organization for the companies surveyed numbered slightly more than 500 people. The overall percentage of MIS employees out of total company employees was 3.2%.

The report, "MIS Organizational Strategies" costs $500 from IDC, 5 Speen St., Framingham, Mass. 01701.

Unix expo set for Sept. 11-14

LOS ANGELES — The first Unix Systems Expo/84, a conference and exhibition for Unix users and resellers, will be held here Sept. 11-14 at the Los Angeles Convention Center.

The conference program will cover networking and data communications, applications packages, micro-to-mainframe links and operating system standards. It will feature user/vendor roundtable discussions as well as a daily address by a speaker on one of several industry areas, including hardware, software, users and resellers. More than 200 companies will sponsor exhibits.

The fee for the full four-day conference and exhibits is $95 through preregistration and $135 at the door; the fee for a one-day conference and exhibits pass is $50. Four-day exhibit registration costs $35, and a one-day exhibit pass is $20. More information is available from Sally Nestler, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

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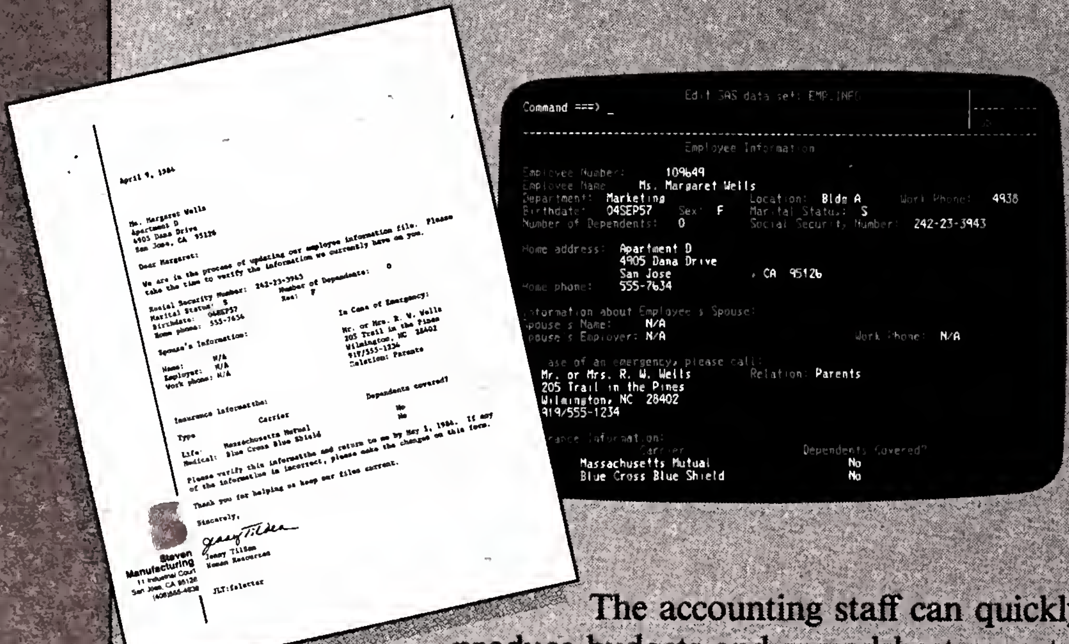

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                          Edit SAS data set: EMP.INFO
Command ===> _
-------------------------------------------------------------------------------
                             Employee Information

Employee Number:        109649
Employee Name      Ms. Margaret Wells
Department:  Marketing              Location:  Bldg A        Work Phone:   4938
Birthdate:   04SEP57    Sex:  F     Marital Status:  S
Number of Dependents:   0           Social Security Number:  242-23-3943

Home address:  Apartment D
               4905 Dana Drive
               San Jose             , CA  95126
Home phone:    555-7634

Information about Employee's Spouse:
Spouse's Name:       N/A
Spouse's Employer: N/A                                   Work Phone:  N/A

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 Mr. or Mrs. R. W. Wells            Relation: Parents
 205 Trail in the Pines
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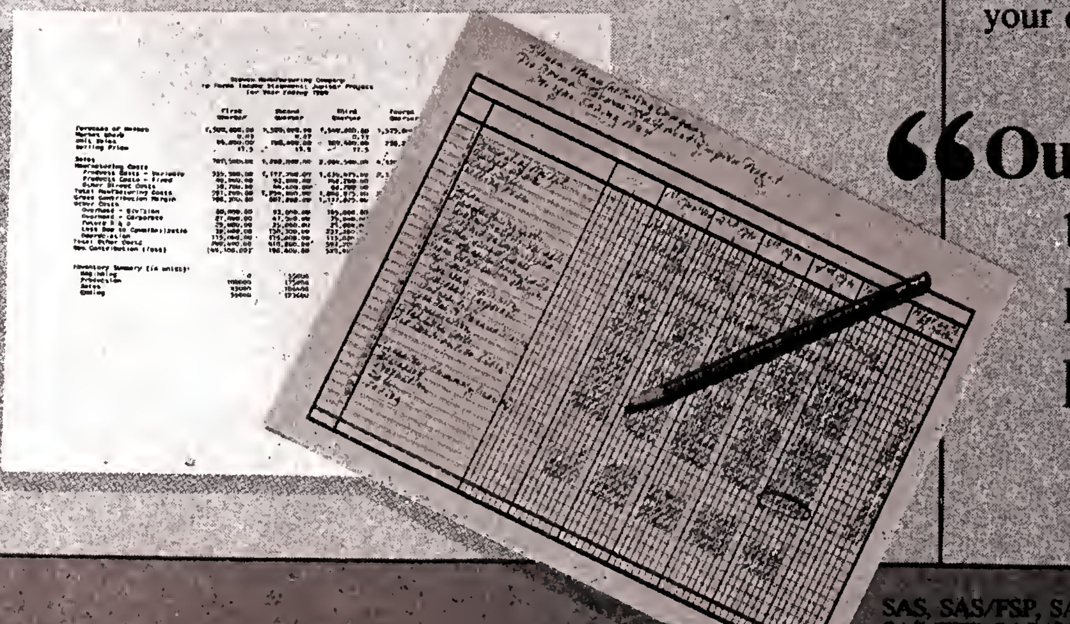

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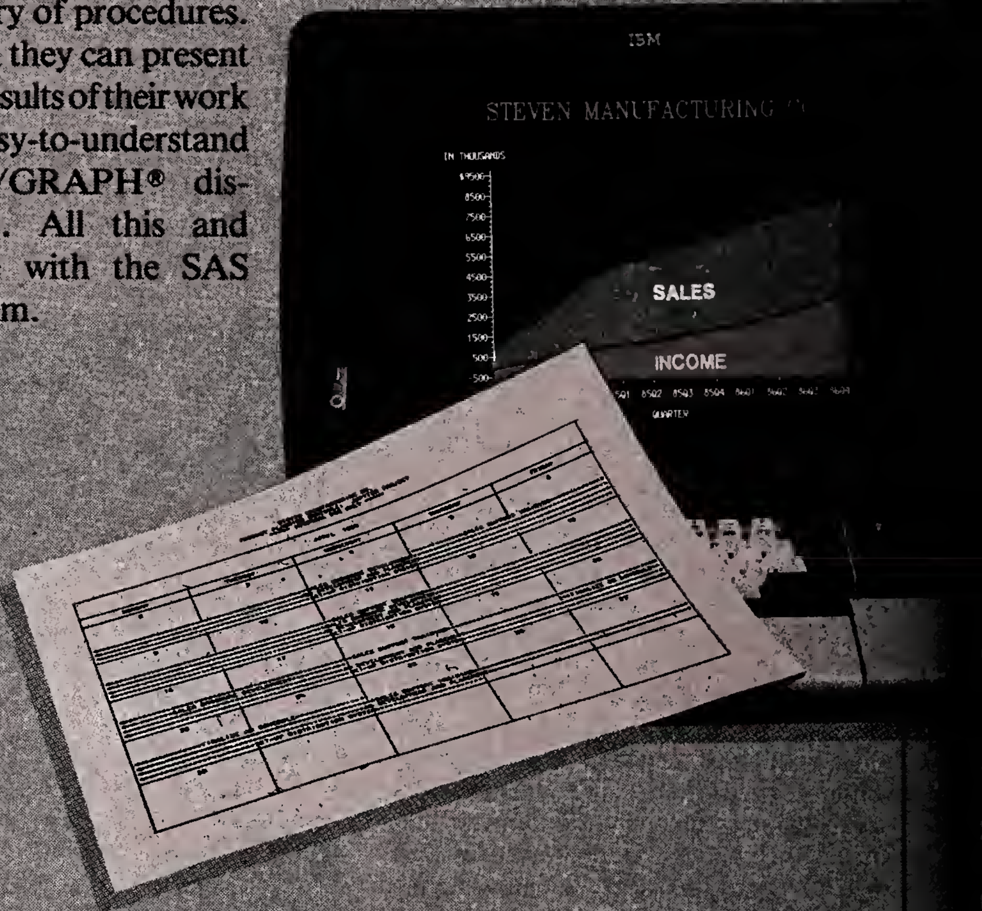

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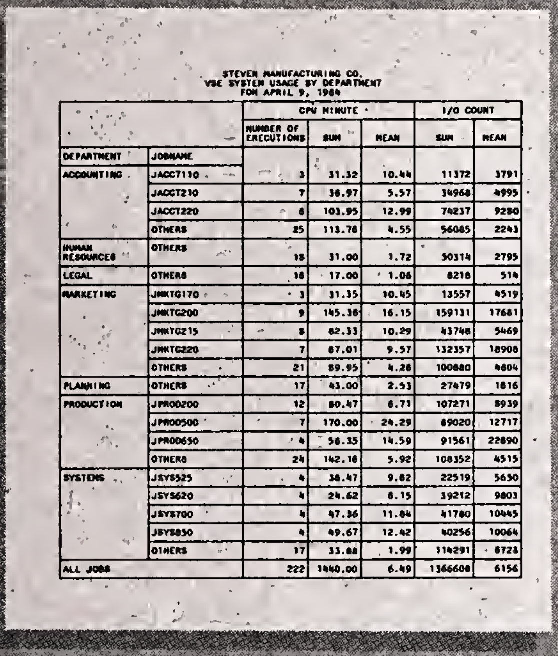
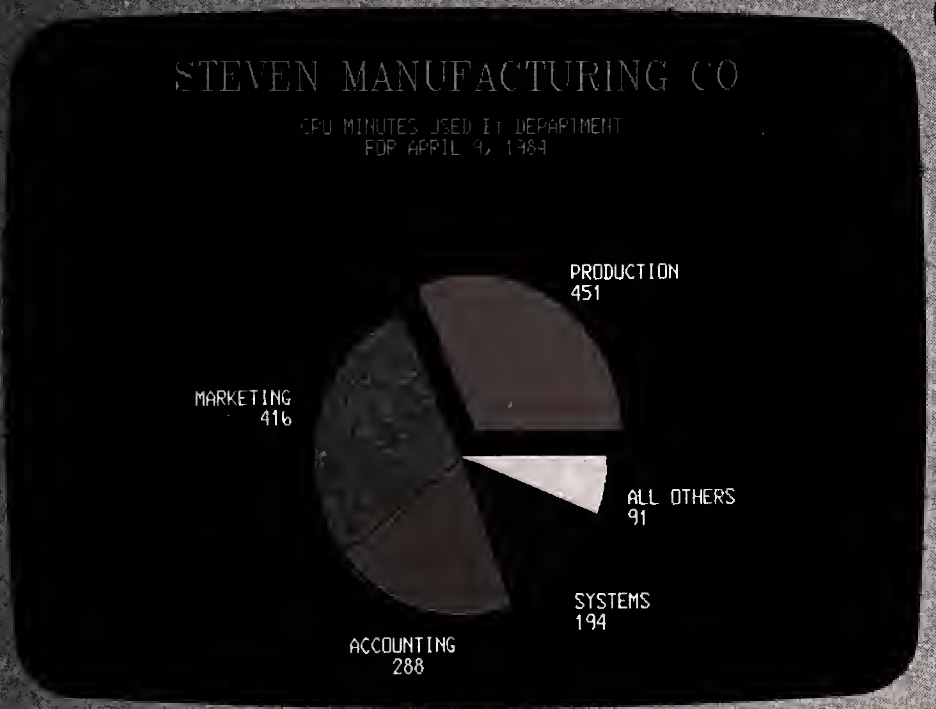


STEVEN MANUFACTURING CO.
VSE SYSTEM USAGE BY DEPARTMENT
FOR APRIL 9, 1984

			CPU MINUTE		I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
DEPARTMENT	JOBNAME					
ACCOUNTING	JACC7110	3	31.32	10.44	11372	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHERS	25	113.78	4.55	56085	2243
HUMAN RESOURCES	OTHERS	18	31.00	1.72	50314	2795
LEGAL	OTHERS	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.38	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHERS	21	89.95	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.59	91561	22890
	OTHERS	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS620	4	24.62	6.15	39212	9803
	JSYS700	4	47.36	11.84	41780	10445
	JSYS850	4	49.67	12.42	40256	10064
	OTHERS	17	33.88	1.99	114291	6723
ALL JOBS		222	1440.00	6.49	1366608	6156



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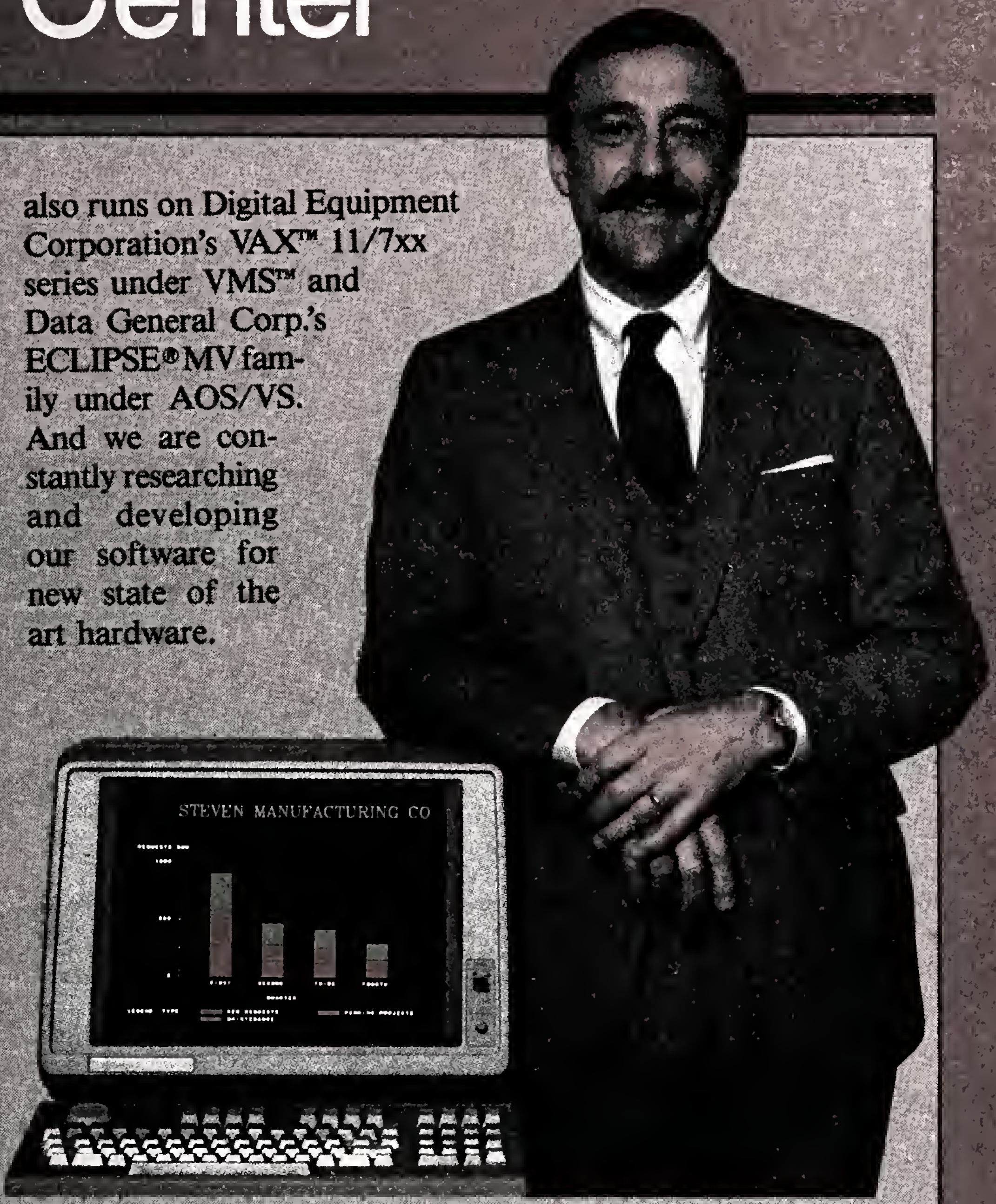

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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

SURREY HILLS — Commonwealth Industrial Gases Ltd. (CIG) has recently become the first Australian user of IBM's 4381 system. The machine will replace the company's two 4341 mainframes in CIG's equipment division and will handle manufacturing, distribution, inventory management, personnel and payroll, a spokesman said. The 4381 Model 2 system features 8M bytes of memory and runs DOS/VSE under VM.

■

CANBERRA — A gallium arsenide semiconductor device is under development here at Australian University's Research School of Physical Sciences. Plasma physicist Dr. Rod Boswell reported that while the device potentially could reduce manufacturing costs of conventional silicon-based semiconductor products, it would have wider appeal if it took the form of gallium arsenide chips.

JAPAN

TOKYO — AT&T International has opened a Unix System sales/support office here. The Tokyo office is working to develop a Japanese version of Unix System V and also to develop standards for Unix systems within major companies here. The new office — which serves Japan, Korea, Hong Kong, Malaysia, Singapore, Taiwan, Australia and New Zealand — will also administer Unix licenses and sales and maintenance agreements, a spokesman said.

■

TOKYO — Y-E Data, Inc. has unveiled four versions of double-sided, 3½-in. floppy disk drives, collectively called the YD-600 series. The YD-620 and YD-625 are 67½ track/in., double-sided drives that offer .5M-byte storage with a track-to-track access time of 5 msec. The YD-640 and YD-645 are 135 track/in., double-sided drives that offer 1M-byte storage and track-to-track access time of 3 msec, the vendor said. These products are half the weight and volume and require about one-third the electric power of 5¼-in. drives and need no maintenance, according to the vendor. Pricing on the series starts at $120/unit, the vendor said.

TAIWAN

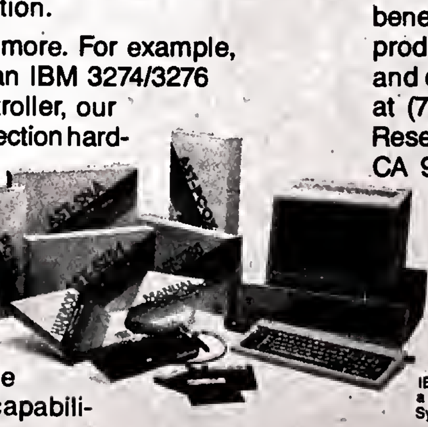
TAIPEI — Multitech Industrial Corp. has unveiled an enhanced version of its Dragon Terminal and Printer Controller that reportedly features an extended range of Chinese software, including word processing, a data base, electronic mail, graphics and financial analysis. The terminal has firmware for processing 22,000 Chinese character symbols.

UNITED KINGDOM

LONDON — Thorn EMI Technology, Inc.'s Datatech Model 9800, said to be the world's smallest ½-in. open-reel tape drive, was recently awarded the British government's 1984 Design Council Award for "the most innovative design among all industrial products." England's Prince Philip presented the award for the 9800 streamer at a recent ceremony held here. The 9800 is a data storage and interface device that can be used with desktop and personal computers, including the IBM Personal Computer. It is equipped with interchangeable components and features diagnostics, interfaces and control sequences, which make for easy maintenance and training and low mean time for repair, according to Thorn.

WEST GERMANY

MUNICH — Siemens AG has won a contract to expand the Taiwanese Electronic Text and Data Exchange in Taipei. The network will be increased by 8,000 lines, for a total of 24,000 lines, making it the world's largest data switching exchange, a Siemens spokesman claimed. Half of the new lines will facilitate additional teletext subscribers, and the other 4,000 lines will connect synchronous data terminals, such as teletext stations, Siemens said. The expansion is slated to take place during the first quarter of 1985.



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Updated French revolution: Technology in public administration

By Peter Bartolik
CW Staff

SAINT-PAUL-DE-VENCE, France — Spurred by the move of its oldest ministry from the building housing the Louvre museum, the French government has embarked on a project that could lead to a revolutionary automation of public administration information processing, according to a government planning executive.

Jean Vidal Salmona, director of the government's Central Agency for Information Systems in Public Administration (Cesia), told a press seminar at Sperry Corp.'s International Management Center here recently that the infusion of new information processing technologies presents a unique opportunity to review and change centuries-old structures and procedures still dominating French public administration.

In the past, he said, "we have put new technologies in an old body" and the use of technology over the past 20 years has meant "little increase in productivity and no significant benefit to [business] and the general public." Administrative structures and procedures did not evolve along with technology, he said.

Government specialists in information processing have adopted strategies to create a positive climate for evolving bureaucracy with new processes in order to reduce the cost of government overhead, while still meeting public and business demand for increased services.

By hiring new civil service employees with "different" attitudes from those of entrenched administrations and by relying on nonconformists already in place, "We create, little by little, new lobbies in various departments and [we rely] on those lobbies little by little to link themselves into a new bureaucracy," Salmona said. Additionally, pilot projects that are proven successful "spread like a cancer."

Revolutionizing potential

One such pilot project has the potential to revolutionize the entire information processing systems of the French government, according to Salmona.

The Economic and Finance Ministry is perhaps the oldest government agency, dating back to Louis XVI, and has been described by an official there as "the only serious ministry" in the government, Salmona recalled. However, the ministry has been ordered by President Francois Mitterrand to plan to move out of its present location in order to enable the Louvre to expand.

With a new building for the ministry scheduled to be completed in 1986, there is an opportunity to design an administrative structure that will be essentially paper-free, Salmona said. Plans call for office automation, file storage and sharing, printer stations, data base links and electronic mail, he explained.

Concurrent with those plans, a pilot project has been initiated to update the collection and transfer of social data, which previously had been communicated by businesses to several government agencies on essentially duplicative paper forms. The project began with 10 companies, grew to 200 and is presently scheduled to include 3,000 companies.

Under the process implemented in the pilot project, companies now submit data to one agency, which then disseminates particular data to the relevant agencies that are cooperating in the project and sharing the financial costs. Businesses with the computer capabilities transfer the data from their data banks directly into the government data banks, and other businesses send data over a videotext terminal.

Videotex terminals, according to Salmona, are currently being provided to businesses and individuals free of charge by the government Telecommunications Ministry in regional areas where directory services are already computerized. By the end of the decade, computerized access to automated directories and to direct government communications will be complete throughout France, Salmona said.

Where the videotex has been used by businesses to transfer the social data to government, it has resulted in almost no error rate, he said. Under the existing paperwork system, the error rate is more than 30% and costs the Economic and Finance Ministry an estimated 100 million francs a year, according to Salmona.

The videotex will be used for electronic mail between business and government and for retrieval of data from government data bases, Salmona said.

The pilot project has been so successful to date that it is believed the government will adopt the processes throughout its public administration agencies within six to 10 years, Salmona said.

One other ministry also has a similar, though more limited, project under way, he said. However, the development of the two systems is monitored by an interministry council, and later this year a decision is expected to be handed down on which system will become the standard for the entire government.

The automated processes are anticipated to address the government's goal of decentralizing the bureaucracy outside of the Paris area, Salmona said. His agency is headquartered in Marseilles, France, but retains a small office in Paris.

Some opposition has been expressed by unions representing the civil servants, he said, "But I think they understood this was something they could not escape from and realized it is better to be involved than opposed."

Data base conference slated for Aug. 27-31 in Singapore

SINGAPORE — The 10th International Conference on Very Large Data Bases (VLDB) will be held Aug. 27-31 at the Institute of Systems Science on the National University of Singapore campus.

The conference includes two days of half-day tutorials and three days of panel sessions and research paper presentations. An exhibition of data base-related products also will be held.

The conference is being cosponsored by four organizations: the Singapore Computer Society, the International Federation for Information Processing Societies, the Institute of Systems Science and the VLDB Endowment.

The registration fee, which covers conference attendance, exhibition admission and conference meals, is $200. Registration for students is $60.

Additional information is available from H. Louise Spain, VLDB-84, P.O. Box 2245, Saratoga, Calif. 95070.

Data base users Washington meet to target future directions in DBA

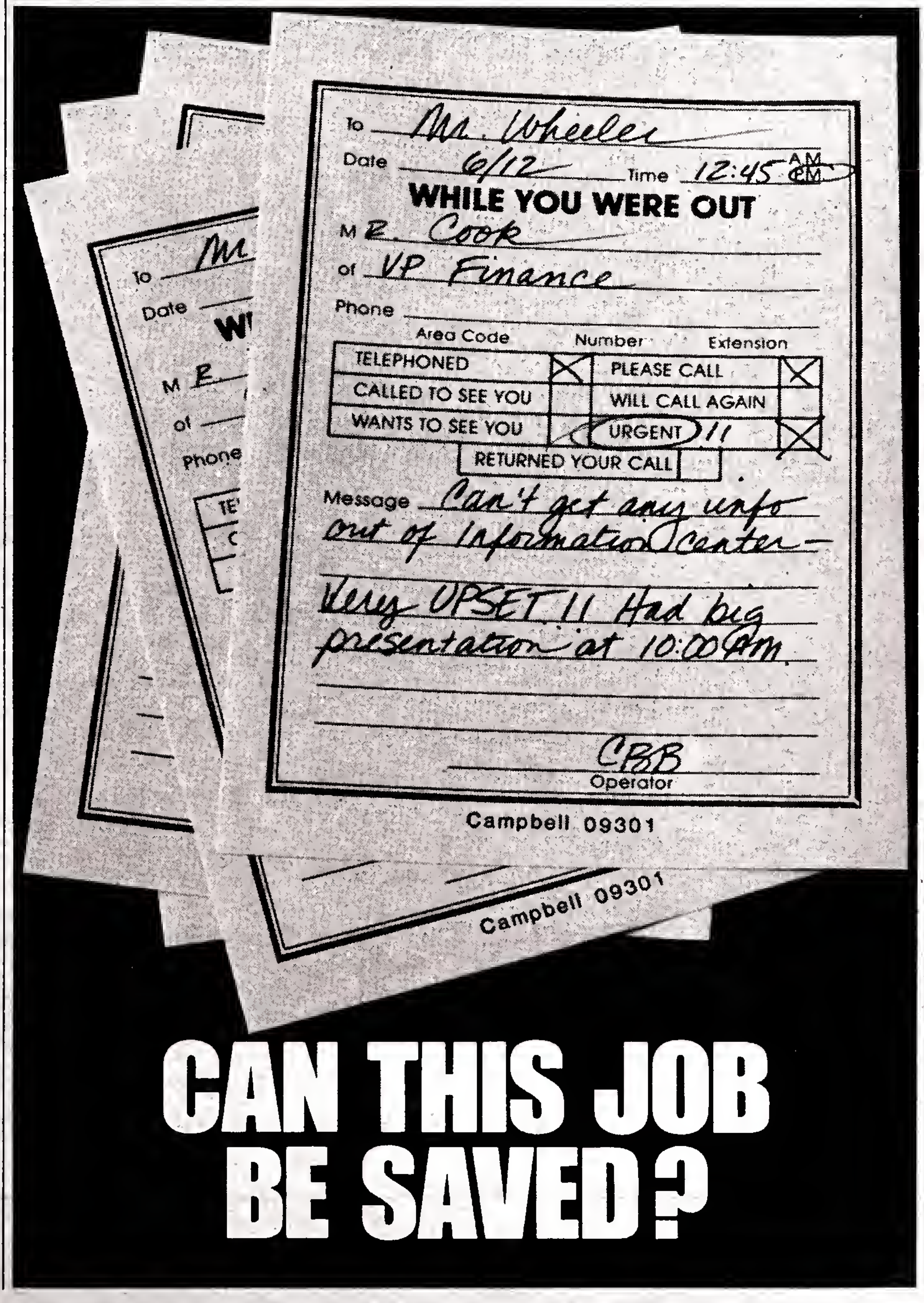
WASHINGTON, D.C. — Future directions in data base administration (DBA) and the relationship of the data base environment to the information center are two of the topics that will be addressed at the Second Annual Conference on Administration and Control of Data Bases to be held at the Marriott Crystal City Hotel here Sept. 17-19.

According to the sponsor, the conference is designed as a forum for professional data base practitioners. The objective of the conference is to bridge the gap between the management and technical sides of the modern data base environment through panel discussions, interactive workshops and presentations by data base experts.

Among the speakers are Gerald Ryan, manager of data system products for IBM; James Tillinghast, development manager for Digital Research, Inc. and Olin Bray, chairman of the Codasyl Systems Committee.

Topics to be covered include the impact of enterprise modeling on business information systems and management and technical issues in DBA functions.

Registration costs $695 from the Institute for Technology Integration, Conference Registration Department, Sixth Floor, 1450 Broadway, New York, N.Y. 10018.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Jury indicts 11 in high-tech slot machine tampering scam

By David Olmos
CW Staff

STATELINE, Nev. — The "Gus case" began one afternoon about a year ago, when an electronic slot machine at the Harrah's Tahoe casino here signaled that some lucky player had just hit a $1.7 million jackpot.

The winner of the giant jackpot was a smallish, balding man named Constantine G. Econopoulos. But unlike storybook tales about overnight fortunes, Econopoulos' jackpot would not lead to a new life of leisure and opulence. Instead, it would lead to the unraveling of an intriguing story of high-stakes, computer-age thievery.

Casino officials became suspicious of Econopoulos when told that police in San Francisco had recognized the jackpot winner as a convicted felon known to them as Gus the Runt.

Two day later, Econopoulos suddenly disappeared from the casino hotel, where he had been staying. He took with him four checks totaling $1.7 million.

Electronic manipulation

Police and Nevada gaming officials caught up with Econopoulos in Texas. In interviews that followed, he admitted that he belonged to a criminal ring that, through sophisticated electronic manipulation, had been cheating casino slot machines in New Jersey and Nevada since 1980.

Nevada gaming officials maintained strict silence about the case until July 3, when a federal grand jury issued a 19-count indictment against 11 people who were allegedly involved with the cheating ring. Econopoulos, who served as the group's treasurer, was not named in the indictment, according to James Avance, Nevada Gaming Control Board chairman.

The indictment said the group carried out 17 separate slot machine rigging incidents in the Nevada towns of Las Vegas, Stateline and Reno and in Atlantic City between July 1980 and August 1983. The payoffs from those incidents totaled more than $3.25 million. About $1.5 million of that total — part of Econopoulos' winnings — was never paid out.

All 11 persons named in the indictment have been arrested and are awaiting trials, Nevada officials said.

"We've known about this gang since 1980, and have been actively working on [the case]," Avance told *Computerworld.*

He said authorities had tried for years to gather enough evidence to prosecute the ring, but could not do so until Econopoulos began cooperating with investigators.

'Sophisticated cheaters'

Avance said the ring members were "sophisticated cheaters" who used a brazen technique to rig the slots.

"They were lining up jackpots using several gang members to divert attention on the floor or to block the view of the slot machines while an experienced person would either open or otherwise manipulate the machine," Avance said. "Then they would have a person like Mr. Econopoulos be the claimer. After the bells started ringing, he would stand there to win, and everyone else would disappear."

Avance said the ring's scheme was 10 years in the making. The group managed to obtain several slot machine models like the ones that were eventually rigged, stripped them down and carried out "very extensive research" into their operation. At least one of the gang members was "very knowledgeable" about computer and slot machine technology, he said.

Gaming officials were cautious in describing the precise manner in which the slot machine chips were tampered with. Avance said only that an "electrical-mechanical device was used to alter the machines" and that "there was data fed to the machine at the time, which caused the jackpot to be paid out."

Avance said the thieves did not replace the machine's chip with a phony one. The specific method used varied, depending on the sophistication of the machine, he added.

But whatever method the thieves used, it enabled them to rig the machine in such a way that they avoided electronic detection, which would have caused the casino to deny payment.

New data loaded into RAM?

An industry expert in chip design speculated that the cheaters probably loaded new data into the slot machine's random-access memory. Other forms of memory in the machine would probably be unalterable using any kind of electrical-mechanical device, he said.

The industry source said that only someone with an expert knowledge of the slot machine's design could pull off such a feat quickly enough to avoid attracting attention.

"If you and I decided we were going to do this right now, there'd be no way," he said.

State and casino officials said slot machine makers have developed new designs intended to thwart future cheating schemes. For example, Avance said, the doors of newer slot machines are equipped with advanced locking devices that sound a warning bell if the door is opened.

"Those systems are now available for older machines, and most casinos are placing them on their machines," he said. He would not specify any new security precautions taken by the gaming board, but he claimed the state is exercising "more vigilance."

Security tightened at Harrah's

Mark Curtis, a Harrah's spokesman, said the casino has beefed up security since the Econopoulos affair, but he would not be specific about the measures taken.

Gaming officials have refused to reveal Econopoulos' whereabouts, saying he may face prosecution in the future.

Named in the indictment were Norman Alvis, Paul Bond, Michael K. Brennan, Francis J. Cullinen, Ross Durham, William K. Kushing, Patti Lane, Stephen S. LaBarbera, Dorothy M. Snider, John J. Vaccaro and Sandra Vaccaro, officials said.

The group faces multiple counts on the felony charges of interstate travel in aid of racketeering, interstate transportation of stolen property and conspiracy to commit tax fraud.

Lower court ruling in Qantel case upheld by federal appeals court

BOSTON — A Massachusetts firm recently won another round in its legal battle with Qantel Corp. as the 1st U.S. Circuit Court of Appeals upheld a $5 million contract fraud verdict.

In an opinion released here on July 11, the appellate court let stand the verdict that assessed Qantel for compensatory and punitive damages suffered by one of its former distributors, Computer Systems Engineering, Inc. (CSE).

The ruling came a year after a Boston federal court jury returned a $17.3 million verdict against Qantel — an award later reduced to $5 million — and while a Hayward, Calif., Superior Court jury was hearing testimony in a case where Datapro Corp. of Detroit was making similar claims against Qantel. The case of Datapro, a Detroit service bureau that distributed Qantel products from 1976 to 1982, is expected to continue into mid-August.

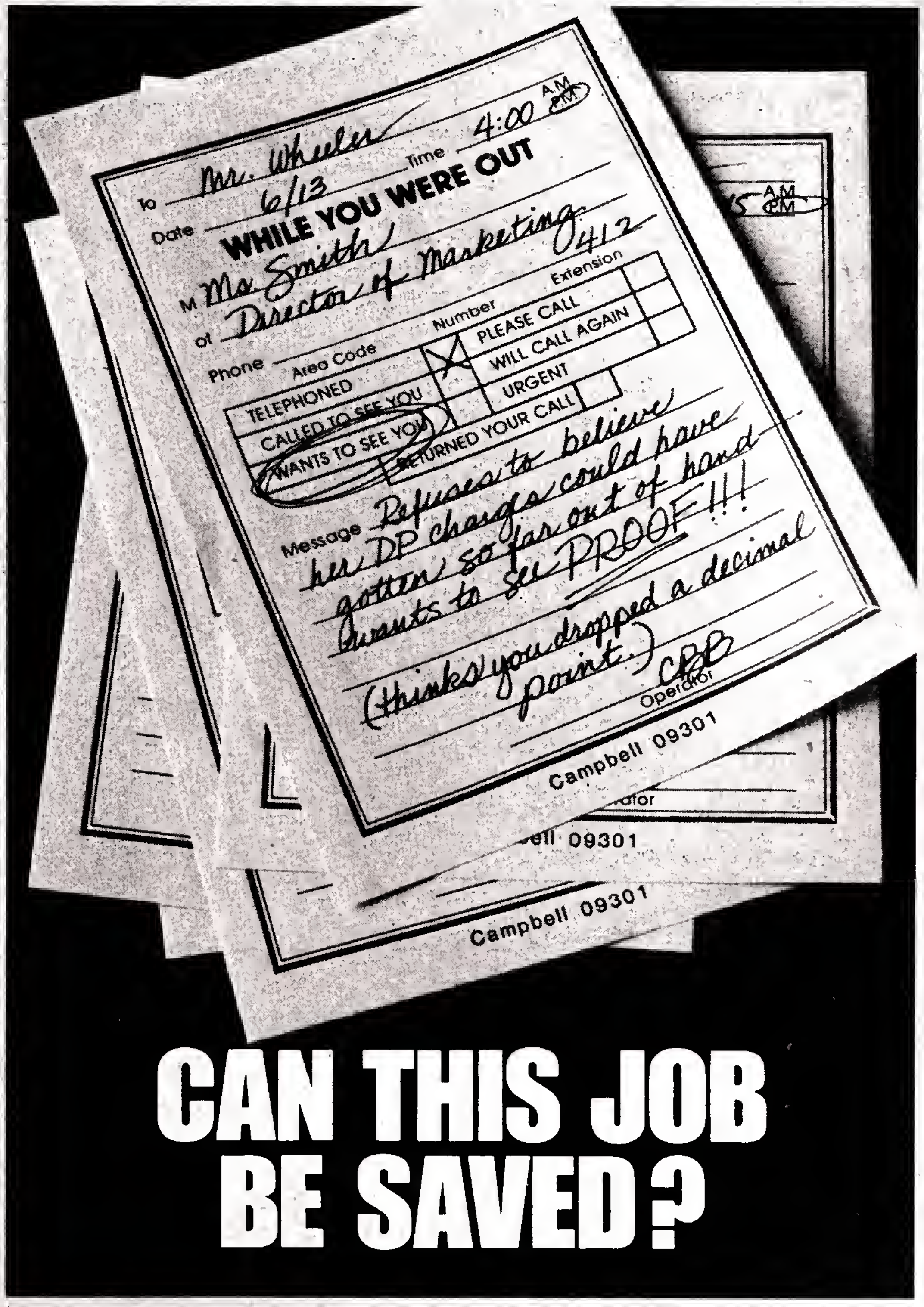
The attorney for CSE and Datapro, Thomas K. Christo, said the appeals court opinion emphasized that a vendor cannot rely on a defense that says, "You [the customer] knew the product didn't work, so you knew we lied about it, and it wasn't fraud." Christo estimated that the court-ordered 12% annual interest could raise the award to almost $6 million.

An attorney for Qantel, Eugene D. Cohen, said Qantel planned to ask the appeals court for a new hearing. However, he said the case was involved less with computers than with general business contracts and how a trial was conducted. One of the key elements in Qantel's argument on appeal focused on Christo's closing arguments to the Boston jury, a summation that Circuit Judge Bailey Aldrich said was in part "outrageous" and potentially prejudicial.

In the Boston case, CSE charged that Qantel officials misrepresented the reliability and availability of Qantel's Solutions accounting software, which CSE said it needed to properly market Qantel's business minicomputers.

The award included $1.1 million in actual losses, $1.2 million in lost profits, $2.3 million in punitive damages and $267,000 in attorneys' fees.

In California, Datapro is claiming $4.4 million in damages.



CAN THIS JOB BE SAVED?

Multiscreen terminals boost insurer's productivity

Save time by allowing clerks to access separate computers simultaneously

COLUMBUS, Ohio — Productivity is up 15% in one department and 33.2% in another at Ohio Medical Indemnity Mutual Corp. (Omim), Ohio's Blue Cross/Blue Shield insurer. The productivity gains have come about since the introduction of 25 IBM 3290 multiscreen terminals, according to Tom Gruss, Omim's assistant vice-president of management information services.

The productivity boost, Gruss said, comes from a savings the terminals have made in the time clerks spend handling claims or calling files to their screens. Prior to the terminals' arrival, clerks continually had to switch between applications on their system or between the computers of the four Ohio Blue Cross Plans, which house Omim's membership files.

Changing from one application to another meant additional commands, lag time and that only one application could be running on any one terminal. Accessing four different computers one at a time meant delays with logons and signoffs.

Continually on-line

Now, Gruss explained, the clerks are continually on-line with the Blue Cross computers and can display a file from each one of them simultaneously. The Omim clerks, he continued, can also use the terminals to display up to four applications or files from their own computer system side by side. In that way, Gruss said, a clerk can instantly compare an error found in a claim — a scrambled doctor's code, for example — with the accurate information from other forms in the computer's file.

There is no need to clear one file from the screen of an IBM 3290 terminal as another is displayed, he said, and that makes for quicker error checking. The need to log on and off of different computers continuously is also eliminated, since the computers of the four Ohio Blue Cross centers each operate on-line with the Omim terminals.

Approximately 150 employees in the Omim customer service department use the 3290 terminals and other CRT terminals, as do between 30 and 40 clerks in the Omim data preparation department, where the 3290s operate on-line with the Blue Cross computers. The data preparation department experienced a 33.2% productivity gain, while the gain in the customer service department was closer to 15%, Omim's director of data operations, Dennis Seinhart, said.

The terminals themselves also represent some innovations, Seinhart noted. Their screens measure 14 by 14 inches; can be divided into four quadrants, depending on the number of files being displayed; and are no more than 4 inches thick.

That thin profile, he explained, is the result of the use of a gas-plasma display, which can present up to 10,000 characters in its orange-on-black format.

Though Gruss could put no dollar estimate on the cost savings resulting from the terminals, he said they allowed more work to be done by the same number of clerks. Omim, Seinhart noted, plans to increase its number of the $7,200 terminals to 250 within the next 12 months.

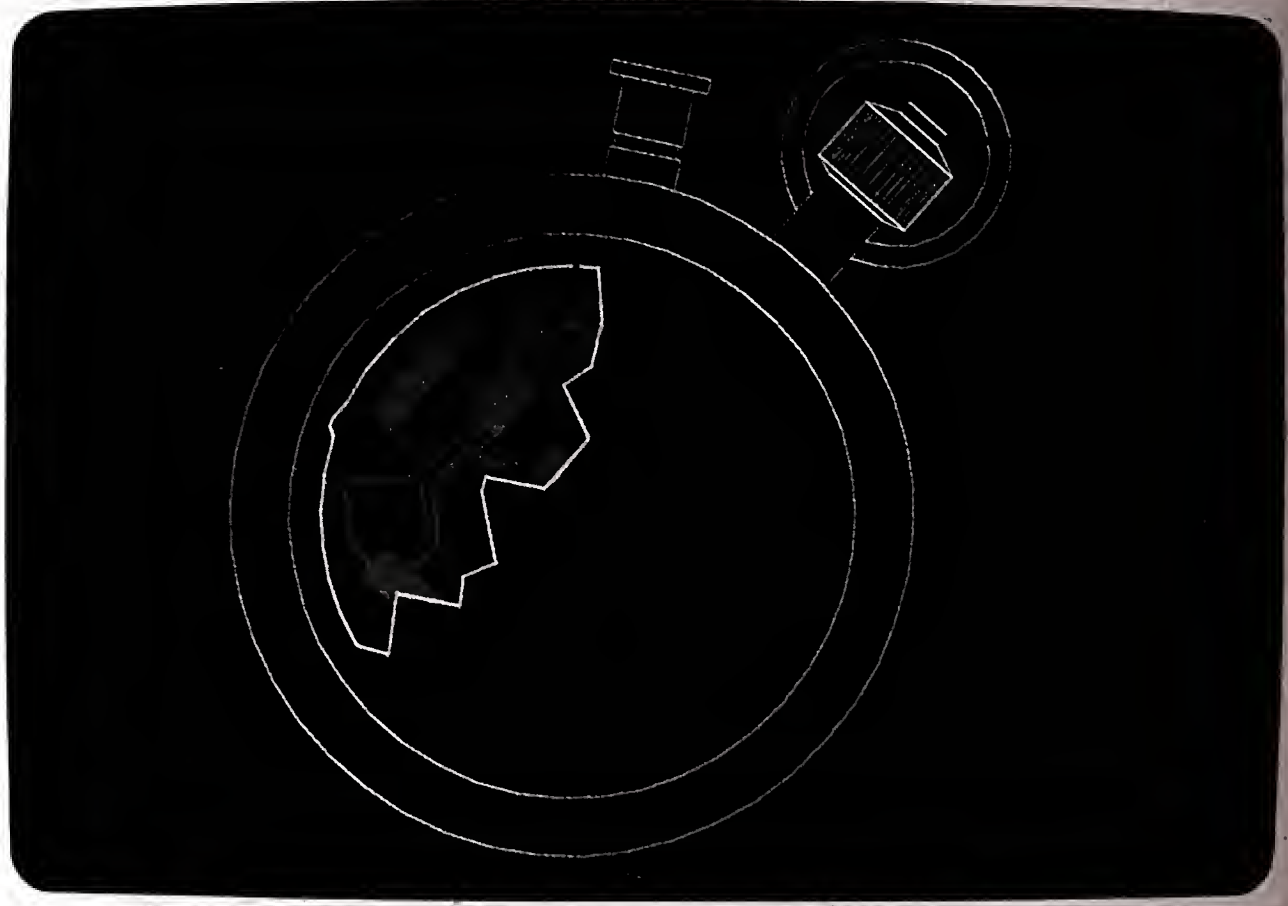
Omim had become a beta test site for the terminals in 1982 after a survey by the insurer pointed out the potential productivity gains that terminal installation could bring.

Omim, with 1,200 employees and subscription income of $500 million, was founded in 1945. It is reportedly the fifth largest Blue Shield Plan in the country. Serving 83 of 88 Ohio counties, Omim processes seven million claims a year and pays more than $1.5 million in benefits a day.

The greatest gains in productivity for Omim occurred in the data preparation department. There, the terminals were used to research membership questions on claims that were rejected due to membership eligibility questions. Rejected claims are checked for eligibility against the membership data bases maintained in the four Blue Cross computer systems, Gruss explained.

In pre-3290 operations, the claims were checked in one Blue Cross area at a time, using a conventional CRT terminal. For each area, the terminal operator had to sign on, key in the contract number, wait for a response screen to appear, check the screen for eligibility and then sign off. If membership status could not be resolved in the first Blue Cross Plan's system, the operator signed on to the next plan, and so on, until all four plans had been checked. This required an average of 33 seconds to check each claim.

Using the 3290 terminal, operator signon and signoff activities are greatly reduced, Gruss said. The operator logs on to each Blue Cross Plan and enters the contract number in each quadrant and starts the associated application processing. No additional logons or logoffs are required until all exception claims have been completed.



An average terminal gets this far in 1.4 seconds. You'll twiddle your thumbs for 14 seconds before it's finished.

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Stop watch courtesy of Heuer Electronic Corp.

Speakers say execs must take more active role in software planning

By John Gallant
CW Staff

LAS VEGAS — Upper management must take an active role in strategic planning to improve productivity in the software systems development process.

That was the message delivered at a work session held during the recent National Computer Conference here by a group of panelists headed by Denis Connor. Connor, strategic planning analyst with the Ontario Worker's Compensation Board, was joined on the podium by Lois Zells, president of the consulting firm of Lois Zells & Associates, Inc., and Scott Kuklin, executive vice-president of Helix Corp.

The speakers agreed that, because of rising systems development costs and frequent project delays, top corporate management has recently begun to look for ways to increase development productivity and improve return on DP investments. But despite that newfound concern, Zells said, management often fails to understand the problems DP faces in delivering applications that meet user needs on time and within budget.

"Management has no realistic view of the planning and control involved in the systems development process. In addition, project participants are rarely given control over the project while they are usually responsible for its failure," Zells said. "Systems developers are usually not given the time to do the job right. Management often tries to compress the development cycle without reducing the scope of the project."

She said that lack of management insight only widens the rift between DP and top management, resulting in wasted energy and further declining productivity. Zells outlined a development approach that coordinates strategic systems planning with long-range, strategic business planning. Management and DP must also learn to "manage organizational expectations," she cautioned, and deal with unclear specifications and emotion-charged "red-flag" issues before a systems development project begins. Otherwise, she warned, a systems effort may be doomed to failure.

"Viewing productivity only as a DP issue further segregates management and DP," Zells said. "Productivity is an organizational problem. We have to move ownership of that problem to higher levels. There has to be a management commitment to solving the problem. Top executives must realize that we cannot continue to handle systems development as we do today."

In echoing Zells' emphasis on management involvement, Kuklin urged executives to support the implementation of what he called a "corporate data base study." Such a study, he said, will aid in the planning and development of both hardware and software systems designed to fulfill the organizational and functional needs of the corporation.

Kuklin promoted an integrated approach to completing a data base study that begins by defining the functional business activities of the corporation. He said planners should then develop logical data models for each business function that can later be incorporated into an aggregate corporate data model showing shared data needs. From that, planners can develop a phased strategy for building an integrated corporate data base.

"Management must be willing to factor a data base study into corporate and strategic planning," Kuklin said. "Executives must realize that such a study will take a long time, maybe as many as six to 10 years. But management must become involved."

SME automation meet scheduled

MONTREAL — Nobel Prize winner Wassily Leontief, economics director of the Office of Economic Analysis at New York University, will address the World Congress on Human Aspects of Automation, being held here Sept. 16-19.

The conference, sponsored by the Society of Manufacturing Engineers (SME) and three affiliated organizations, will feature as its keynote speaker sociologist Rosabeth Moss Kanter, author of *The Change Masters* and *Men and Women of the Corporation.* Also to speak will be Witold Rybczynski, author of *Taming the Tiger* and *Paper Heroes: The Struggle to Control Technology.*

Topics of the sessions, panel and roundtable discussions set for the conference range from "Critical Issues of Automation" to the "Problems, Promises and Solutions" of automation.

For members of SME and its affiliated sponsors (the Computer and Automated Systems Association and Robotics International), registration is priced at $260 for the full conference and $150 for one day. Nonmember prices are $295 for the full conference and $185 for one day.

Additional information is available from Argenia Ford, SME Administrator, SME, One SME Drive, Dearborn, Mich. 84121.

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NEWS

Electronic mail lets insurer cut internal paper use, costs

By Edward Warner
CW Staff

LAS VEGAS — A major auto insurer is saving roughly $750,000 a year because it adopted an office automation system that "literally changed the way people worked."

Most of the savings at USAA General Indemnity Co. came from the replacement of paper copies with electronic mail and from the system's labor efficiencies, which bypassed the need to increase clerical staff, according to Robert L. McDowell, who spoke at the recent National Computer Conference here.

McDowell, now of Arthur Young, an international accounting and consulting company, was formerly with USAA General Indemnity, where he spearheaded USAA's office automation program, begun in 1982.

McDowell, regional director of office automation consulting with Arthur Young's San Antonio office, said a study conducted after USAA's office automation system was tried out as a pilot project found that its electronic mail functions provided an 80% cut in the amount of time employees spent on the telephone.

That survey, he continued, also found a 50% reduction in the amount of paper used for interoffice memos, a 61% cut in the number of copies being made and a whopping 94% reduction in the use of interoffice mail — all due to the system's electronic mail features.

"I honestly believe you can cut out 75% of the internal paper an organization creates," McDowell said.

USAA began its venture into office automation, he explained, with a study in 1980 that found, among other things, that as many as 400 of the firm's 5,000 or so employees were involved in moving mail around USAA's headquarters, a building one-third of a mile long.

That study also found that any employee had no better than a 34% chance of getting through to another by telephone.

Justification for electronic mail

Those two bits of evidence made a good argument for inclusion of an electronic mail system in any office automation system, McDowell said.

USAA already had an extensive involvement with desktop data processing, in the form of 3,200 terminals in use by about 3,000 employees.

The widespread use of terminals had come about at the insurance company because most of the firm's business is conducted over the telephone, McDowell said.

Ninety percent of [USAA's insurance] claims are processed without referring to a piece of paper," he noted.

USAA settled on Digital Equipment Corp.'s All-In-1 office automation package, which includes word processing, calendaring, electronic mail and other features, for its pilot project.

The project, begun in January 1982, provided 120 employees with a variety of DEC workstations, mostly Decmate 220 and 240 models, and linked the workstations with two DEC VAX-11/780 superminicomputers.

At the end of the pilot project, USAA retained the All-In-1 system, expanding it to serve 500 employees, linked with eight VAX-11/780 machines.

The key issue in implementing an office automation system, McDowell said, is employee training.

He said that is why each USAA employee who was to become involved with the office automation system received 16 hours of instruction and each secretary got an additional 16 hours.

"If you're committed to support, within three to four weeks, you've got a winner [of a system]," McDowell noted.

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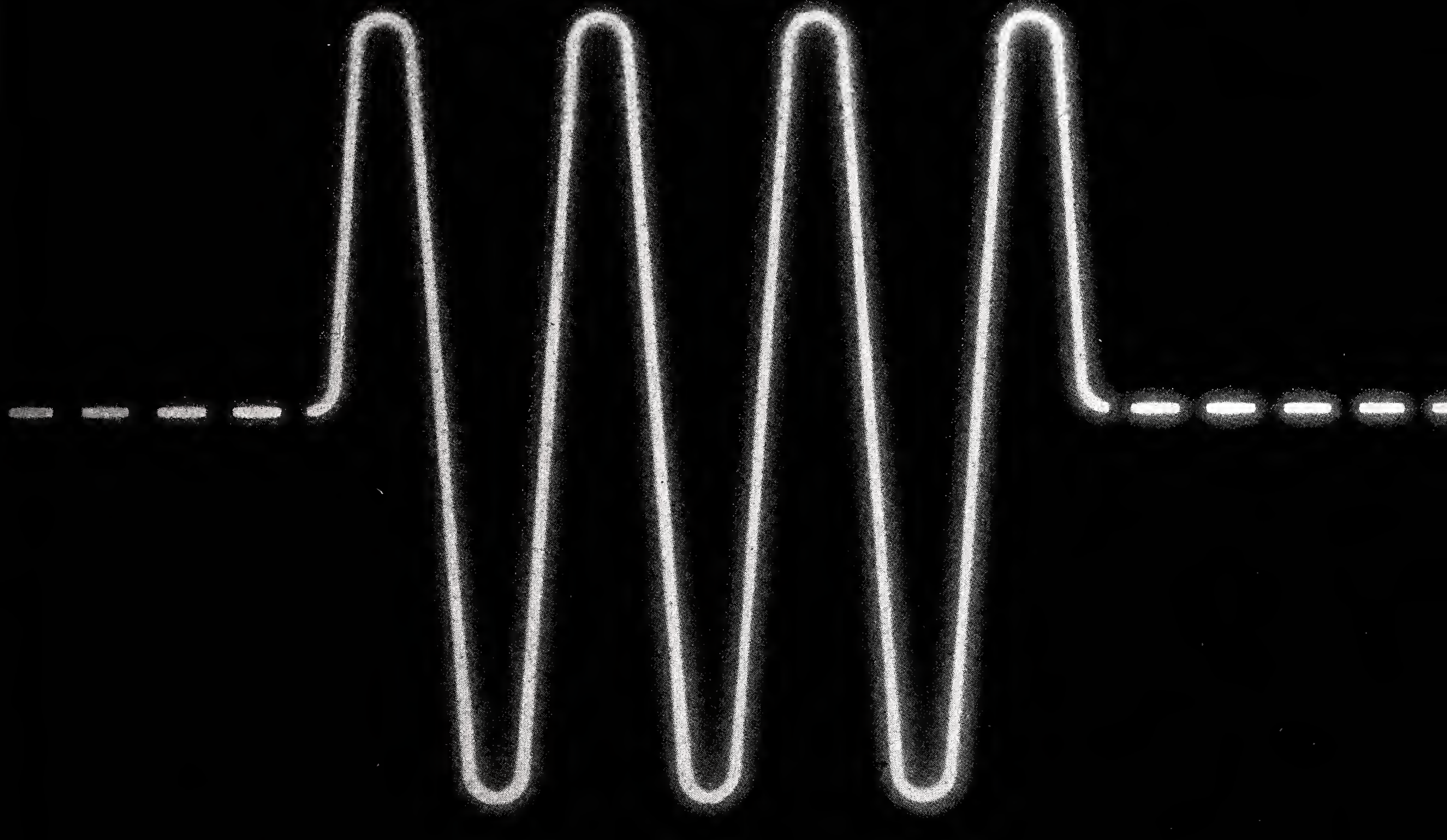

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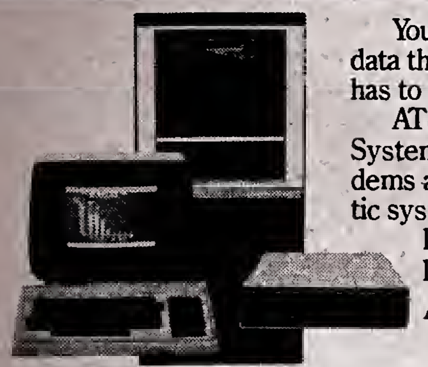

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INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

OA gives firm's training center 40% hike in productivity

Workstations with graphics, word processing form base of system

BOISE, Idaho — A 40% increase in productivity has come to the Learning Resources Center of the Morrison-Knudsen Co. as a result of its adoption two years ago of an office automation system that incorporates graphics and word processing, according to the center's director, Danny Langdon.

The center, which provides training courses for its 18,500-employee parent firm, uses its office automation system of four Xerox Corp. Star 8010s to automate the production of course materials, Langdon said. Two of the center's 8010s are shared by its writers, and the other two are used by Langdon and the office secretary.

Langdon, in charge of training at Morrison-Knudsen for the last four years, first began using the Xerox 8010 system last year. "Using the 8010, I cut production time in half on the last training course that I wrote," he reported.

Morrison-Knudsen is a multinational conglomerate involved in fields ranging from shipbuilding to mining and construction.

The firm provides engineering, design, construction and management services worldwide. It builds dams, refineries, pipelines, power plants and ships; fabricates steel; operates coal mines; and remanufactures railroad cars and locomotives. In all, the firm has six major operating groups and eight subsidiaries, including what is said to be the largest shipbuilding operation on the West Coast.

The 8010s in the Learning Resources Center are used for word processing and to incorporate graphics with text. They are linked in an Ethernet local-area network with a Xerox laser printer and a 42M-byte disk storage unit. Having a laser printer at hand, Langdon noted, "is really nice if you want to test out a [teaching] program" by making a limited run of copies. The laser printer also prints directly to transparencies for classroom use, a feature that Langdon said gives greater quality than when transparencies are made thermographically.

The Ethernet local network also links the center's 8010s with identical units in Langdon's supervisor's office and in the company's personnel office and provides electronic mail communications between each machine. Using the local net, program developers can show their text to each other by transferring it among the workstations.

Langdon said it was the quality of the Xerox system that caused him to choose it over what he saw as its closest competitor, the IBM Displaywriter. Another reason why the Xerox system got the nod, he noted, was that "at the time IBM only had a half screen" for display.

Langdon said he appreciates the 8010 monitor's display of a page in actual size with black print on a white background. "What you see is what you get," he said. "One of the biggest advantages of that is when I sit down with one of my subject matter experts, he can just sit there right with me and say, 'No, I want to have that over here. Make it bigger or put a graph in there for me' or whatever. From the standpoint of working with others, that's really tremendous."

When his firm purchased the system, Langdon noted, the 8010 was also the only system to incorporate a mouse for cursor control. The mouse was not the deciding factor for Langdon, he said, but it did play a role in the system choice.

Another of the 8010 system's features that Langdon likes is its use of icons to display machine functions. "What it really reminds you of is your desktop," he said.

The Morrison-Knudsen Learning Resources Center provides a range of employee training and management development sessions. Each of four classrooms can double as a video studio, and complete audio and videotaping allows Langdon's staff to produce all of the company's support materials in-house.

The 8010's graphics package, Langdon said, allows him to "produce the illustrations as I type the text, instead of leaving blanks the way I did before." The system includes options to select a dozen or more different type styles and several languages.

To prepare an instructional program, Langdon said, "We develop course objectives, prepare an outline and write the text; or we edit existing materials to put them in the best format for learning."

From Langdon's perspective, the only problem with the 8010 system is "the training aspect of it," which, he said, "takes longer than it should." But Langdon was quick to add that training time is not a major problem and that support from Xerox has been excellent.

Overall, Langdon was pleased with the Xerox 8010 system and its Ethernet local network. "It's an outstanding product," Langdon said. "It looks like it was made for training because it allows me to do all the kinds of things I need to do."

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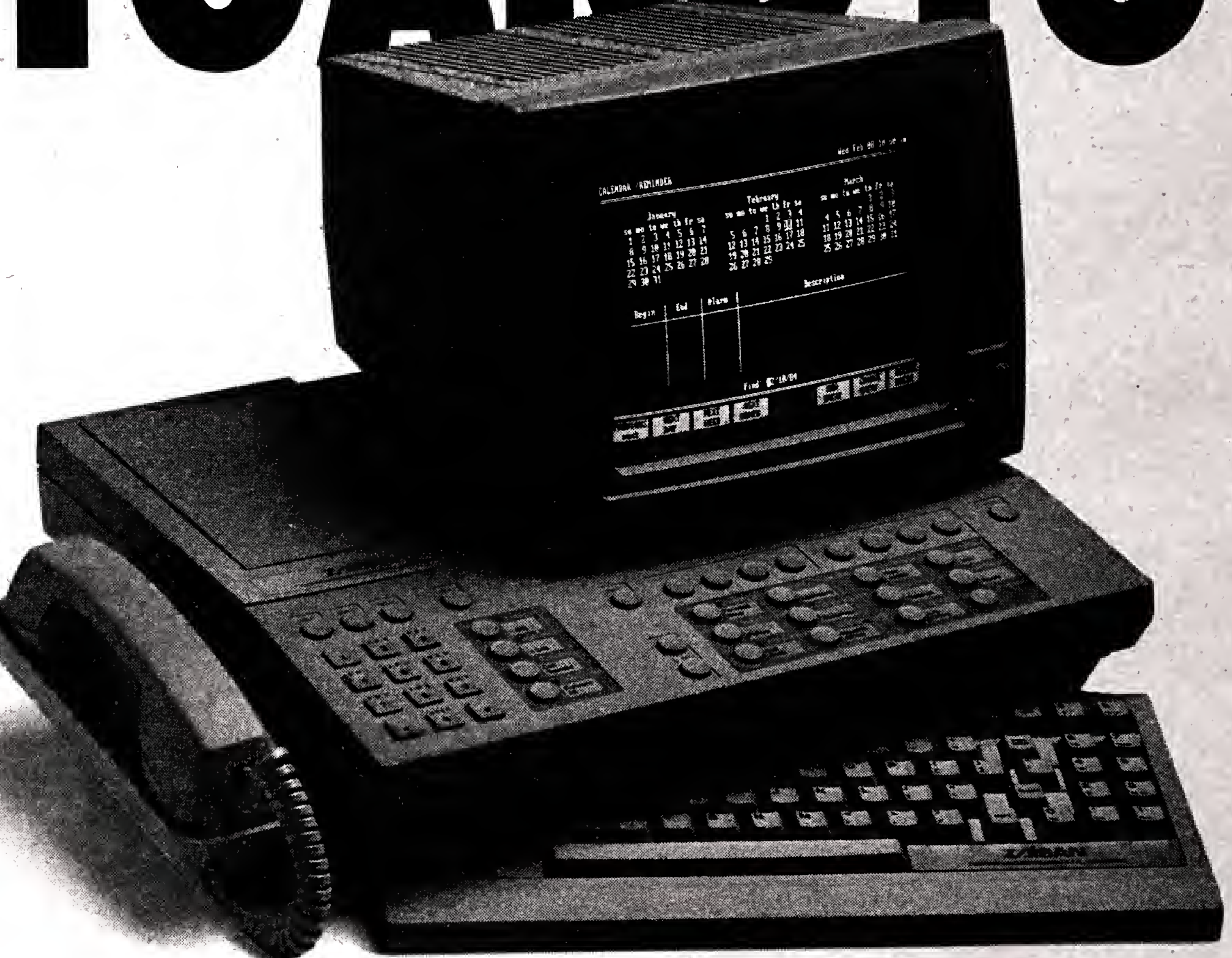

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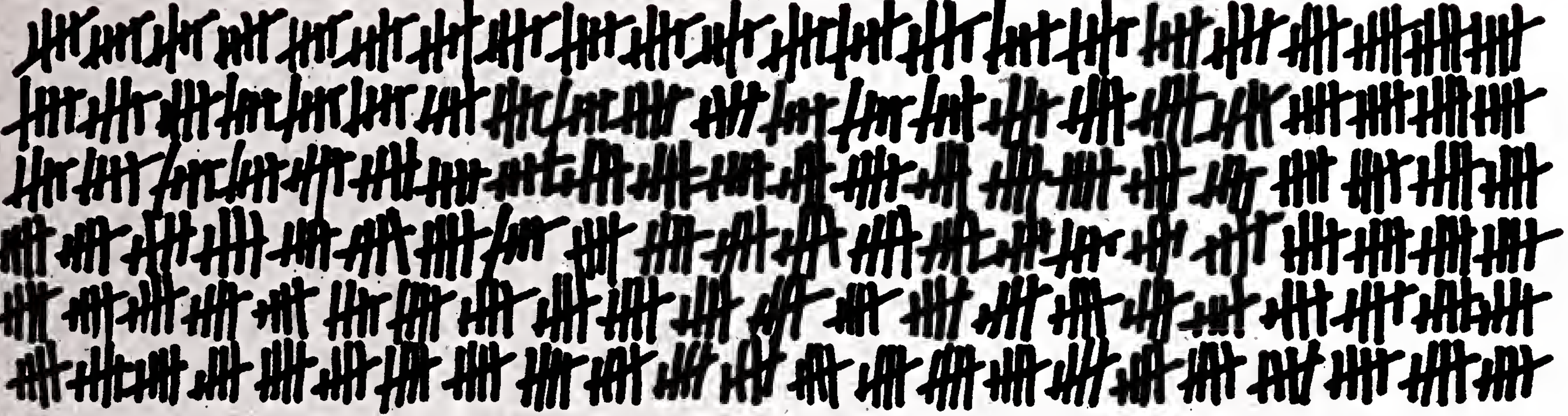

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NEWS

CALENDAR

WEEK OF AUG. 26

AUGUST 26-30, BOSTON — **Information Center Conference & Exposition.** Contact: Loretta Wolman, Warren/Weingarten Publications, 38 Chauncy St., Boston, Mass. 02111.

AUGUST 27-28, LOS ANGELES — **Vsam OS & DOS Performance and Tuning.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

AUGUST 27-29, LOS ANGELES — **Information Center.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810. Also being held Sept. 11-12 in Chicago.

AUGUST 27-30, NEW YORK — **CICS Debugging.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

AUGUST 27-30, SAN DIEGO — **The 11th Annual North American Data General Users Group Conference.** Contact: Dolores Risi, Users Group Clerk, Data General Corp., 4400 Computer Drive, Westboro, Mass. 01580.

AUGUST 27-31, BOSTON — **Structured Design and Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

AUGUST 27-31, SINGAPORE — **The 10th International Conference on Very Large Data Bases.** Contact: Dr. Gerald A. Wilson, Advanced Information & Decision Systems, 201 San Antonio Circle, Mountain View, Calif. 94040.

AUGUST 29-31, LOS ANGELES — **CICS/VS Internals for Systems Programmers.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

WEEK OF SEPT. 2

SEPTEMBER 4-7, NEW YORK — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held Sept. 10-13 in New York.

SEPTEMBER 5-7, WASHINGTON, D.C. — **Configuration Management of Software Programs.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

SEPTEMBER 5-7, SAN JOSE, CALIF. — **Office Automation and the Technology Revolution.** Contact: Data-Tech Institute, 386 Franklin Ave., Nutley, N.J. 07110. Also being held Sept. 12-14 in Columbus, Ohio.

SEPTEMBER 5-7, CHICAGO — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 5-7, NEW YORK — **Managing Projects in the Structured Environment.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 5-7, ALBUQUERQUE, N.M. — **New Gateways to SNA.** Contact: Data-Tech Institute, 386 Franklin Ave., Nutley, N.J. 07110.

SEPTEMBER 5-7, TORONTO — **Capacity Management Forum.** Contact: Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

SEPTEMBER 5-7, WASHINGTON, D.C. — **Artificial Intelligence.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 6-7, SAN FRANCISCO — **Systematic Software Testing.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

WEEK OF SEPT. 9

SEPTEMBER 10-11, BOSTON — **Fourth-Generation Data Management Software.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 10-11, WASHINGTON, D.C. — **DBS IV.** Contact: Seminar Registration, Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

SEPTEMBER 10-11, HASBROUCK HEIGHTS, N.J. — **Supporting and Maintaining the Data Communications Network.** Contact: Data-Tech Institute, 386 Franklin Ave., Nutley, N.J. 07110.

SEPTEMBER 10-12, TORONTO — **The Second International Congress & Exhibition on Computer**

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EDITORIAL

Social responsibility: the mark of a DP pro

From time to time, there occurs a series of events that crystallizes the awesome and growing impact that computerization is making on virtually every aspect of modern life, an impact that can surprise even the veterans of the data processing business.

Take the national elections and, in particular, the recent Democratic National Convention in San Francisco [CW, July 23], as startling examples of how computerization has quickly spilled from the DP shop to the streets.

There on the floor of the Moscone Center were thousands of delegates, and for each delegate there existed a computer file stuffed with information on each delegate's income, age, occupation, political bent and ethnic background. With all the concern in the computer industry about privacy-related issues, it was a little unnerving to learn that this rather sensitive and private data was readily available to, among other people, the political correspondents of the major networks. They simply dispatched runners to a nearby terminal or networked micro whenever they wanted information on the delegates, and within minutes, they had it.

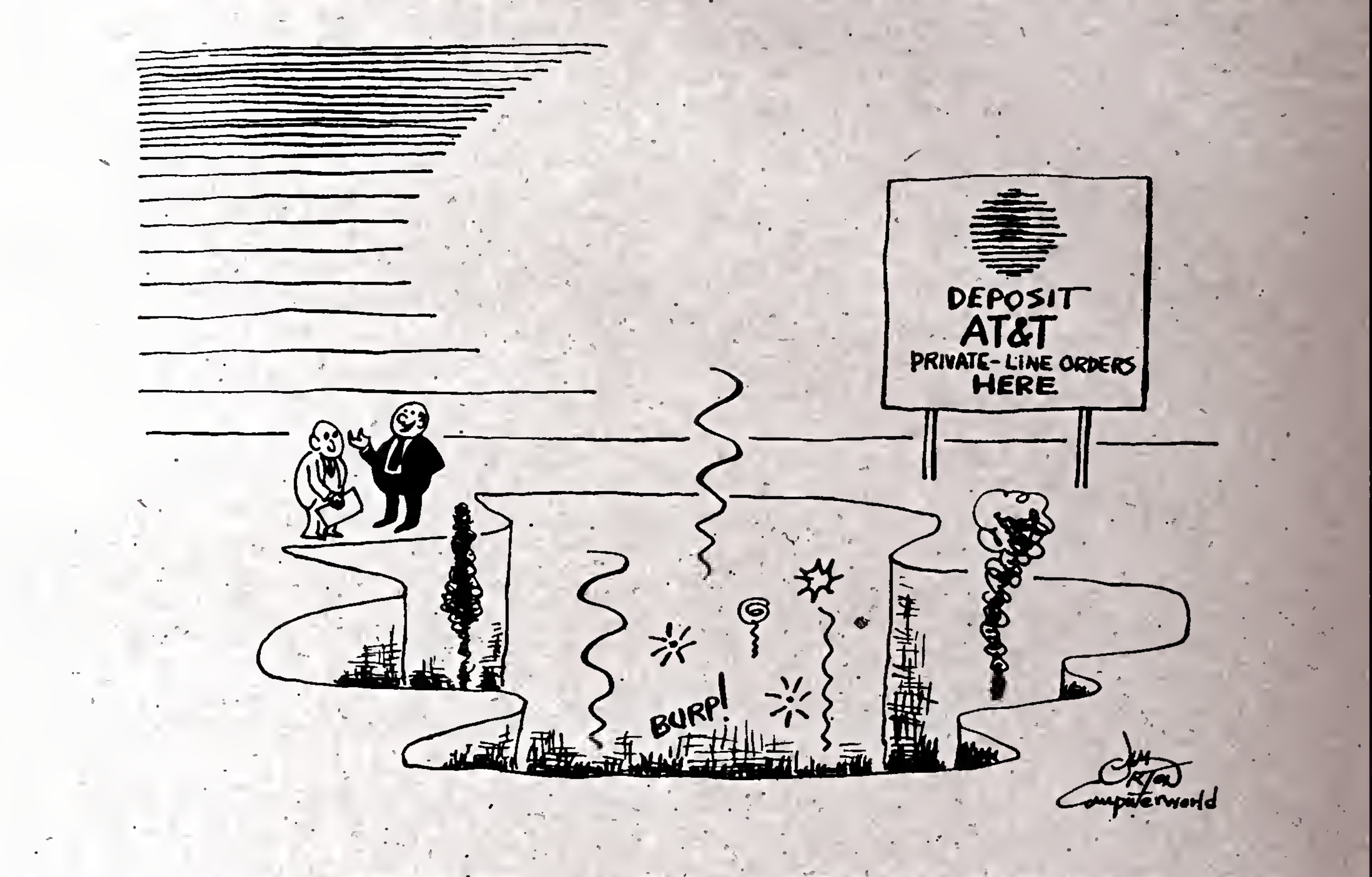
It is not hard to imagine national conventions, most likely the next ones in 1988, where this information is available to everyone, accessible from the convention floor via remote terminal or from the comfort of one's living room via interactive videotex. That's a bit scary.

There are other problems with the computerization of politics, which convention organizers are wisely addressing, but which nonetheless point to the potential imbroglio of mass automation. In particular, once organizers made the decision to entrust so much of the convention proceedings (such as the voting, delegate and candidate security, messaging and so on) to computers, they had to deal with the threat of sabotage of those proceedings — in a day when hacking is becoming an American art form. More rapid proliferation of electronic conventions will only heighten both the threat and the need for greater security of data. And this will have to be accomplished outside the sanctity of the DP shop.

Leaving politics and turning to the world of international athletic competition yields another view of the mass computerization outside the DP shop. *Computerworld* has published several articles in recent months showing clearly how sophisticated computer systems have permeated every aspect of the Olympic Games, from "intelligent" systems that prescribe to the letter an athlete's eating, sleeping and training routines to state-of-the-art communications systems that will speed contest results to an audience of 500 million worldwide in seconds.

Or consider the computerization of an event such as the America's Cup race [CW, Sept. 5]; of highly sophisticated weapons systems, which run entirely independent of human interaction; of medical diagnostics; of the education of our children.

All of this points to a corresponding growth in the social responsibility that must be borne by those who know and understand a computer's potential and limitations. Just as nuclear scientists have left the lab and applied their expertise to pressing social issues related to the fruits of their work, so too must DP professionals play an active role in the enormously complex issues that will arise from inevitable mass computerization. To do otherwise would be to shirk truly professional obligations.



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LETTERS

Incorrect code

With regard to the article on structured programming by Jeff Thompson in *Computerworld*'s Special Report [CW, May 28], please note that example C is in error.

The Boolean expression:

A = B and C

should be transformed as follows:

A = B *or* C

In other words, in Example B of the article, the statements:

```
  IF GROSS-PAY GREATER THAN 1200.00
    AND FICA-PAID LESS THAN 150.00
```

should have been transformed as

```
  IF GROSS-PAY LESS THAN OR EQUAL TO
1200.00
    OR FICA-PAID GREATER THAN OR EQUAL
TO 150.00
```

Similarly, the other two transformations between Examples B and C are incorrect.

K. T. Shuey, Jr.
Houston

Defining today's Cobol

I found Richard L. Conner's "Cobol, your age is showing" [CW, May 14] and the rebuttal by Jerome Garfunkel "In defense of Cobol" [CW, June 11], both interesting and informative.

However, as I read Garfunkel's article, I realized that he wasn't defending the Cobol I use at all, and if anything, he reinforced Conner's assertion. The language he defended, Cobol-80, does not exist now and will not exist for many years.

The improvements he cited are what Cobol lacks today, which is part of the reason why it is such a cumbersome language to use. When you look at what Cobol-80 will be and what Cobol-74 is, it is difficult not to agree with Conner's assessment that the language today is antiquated.

But what's tragic is that although there is at least one more modern language available today, there are still going to be a lot of programs written in the antiquated standard.

John Arbuckle
Farmington Hills, Mich.

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VIEWPOINT

Tsunami ended

LECHT ON SCIENCE
Charles P. Lecht

This is the second in a two-part series.

The first part of this two-part essay on my unfinished book, *Tsunami* [CW, July 16], ended just as I was about to comment on Japan and Germany as computer industrial powers.

Five years ago, Japan's computer industry appeared as a growing dragon no longer capable of hiding under its tatami mat; Germany's as a sleeping eagle, albeit with one eye open. Today, the dragon has emerged, and we can do little more than gape in awe at its quality and vitality. And why not? It is the progeny of two of the world's most advanced peoples: Americans and Japanese. It is no miracle that it happened in Japan, for all the obvious reasons, but one reason that is often forgotten is that this old people is possessed with an intelligence of rare brilliance. We counted on it in our entry into post-World War II Japan; we set up our computer businesses, fully knowing that Japan's lack of one of its own spoke only to its poverty of materials — not brains.

That the Japanese computer industry is as accomplished as it is today reflects the finest in the character of our people. Even as we watched our Japanese computer systems marketplace slip from our control, and we had to know that this would occur, we exhibited our forebearance and friendship. That the Japanese computer industry is second only to ours speaks eloquently of the power of these characteristics to overcome the widest of cultural differences.

Japan's intelligent focus

Tsunami chose Japan as No. 2 in today's world of computer technology because I felt that Japan's overall focus in 1978 was intelligent — in large-scale integration, value-added engineering and the replacement of its widest base of foreign systems by those of Japanese manufacture. While over 50% of Japan's installed base in 1983 was of Japanese company origin, (by if-sold value), most of the biggest systems were still American. Since most computer industry profits mirror, in their size, that of the systems whose sales from which they are derived, Japan's computer industry suffers from lack of reinvestment capital to wrest control where it counts.

Advanced communications and software are emerging as every bit as important than processor and memory technologies in the design of new systems. Replacement of the upper-end base of foreign products will not be possible through the strategy thus far employed to replace the lower end — namely, offering compatible alternatives. In today's world of computer systems products, processors and memories alike are being sewn together by real and ideational principles of enormous consequence to manufacturers and users alike. New links are emerging that must affect the success of any product, large or small. These come in the form of software agreements that can yield enormous advantages to those included, while locking out the less fortunate.

Japan's seemingly fierce determination to be self-sufficient in fulfilling its internal needs derives from more than purely financial reasons. The Japanese fear electronic capture, and who could blame them? So do we. No small, backward, underdeveloped nation already so bound by other entanglements that another would make little difference, Japan is a 20th century marvel with the world's fifth largest population. Having lived through years of total fuel dependency, its leadership is well aware of what such capture could mean. Some people say that as crude oil fueled the last industrial revolution, so very large-scale integration will power the next. The Japanese people are too intelligent to get caught without fuel twice.

To achieve self-sufficiency, Japan's computer industry must grow large enough to make its presence felt both at home and abroad. Otherwise, its dragon will become a pussycat of no practical use. To do this, the Japanese government is deregulating its communications giant, Nippon Telegraph and Telephone Co., in the spring of 1985 to allow it to compete in its already highly competitive computer industry, as did America to AT&T. This synthesis with communications, already under way for some time now, will provide a new dimension to the Japanese computer industry; it will emerge more than three times its previous size of less than $10 billion worldwide.

Japanese companies will be able to produce just about anything we can in the way of products. Only in that mysterious region where cultural differences handicap the outsider wishing to sell his story, or in those regions where national security emerges to exclude him, will Japan be unable to purvey wares if it wants to.

Until recent times, American companies were not subject to even these most basic of exclusions — our systems were so sorely needed that they were to be found everywhere: in the Japanese diet, schools, military, even in its temples. Without the availability of IBM, Sperry Corp., Honeywell, Inc. and Data General Corp., its spectacular economic development would not have been possible. Furthermore, its happening has proven that we can work together to obtain tangible rewards while transferring know-how between each other.

It would indeed be a tragedy if these achievements went by the wayside as Japan's computer industry grew; together, we've proven so effective. While it may only be natural that American products in Japan be replaced by those from Japanese companies as its computer industry continues to grow, both American and Japanese companies will want to ensure fair treatment in the process. They have a lot more to gain by cooperating.

What about Germany?

So what about Germany? By now, the eagle has awakened, but as eagles are wont to do rather than flap out of their lofty nests, Germany seems to have decided to stand there stretching. Captured, electronically speaking, the German eagle's yawn betrays its confidence that when it gets the motivation to do so — if it ever does — it can escape into the wild blue yonder, soaring high to become an instantaneous leader, under its own control, in world computer systems technology. Possessing such technical competencies as may only be found in the best American or Japanese laboratories, were Germany to close its doors to outsiders and put all of its scientists to work in German companies, it could fulfill all of its internal needs and then some. I don't believe this is true in any other country except the U.S.

High-tech companies based on German soil and owned abroad account for most of Germany's computer systems production. Thus, unlike Japan, where at least two-thirds of this is manufactured by Japanese-owned companies, the Germans are critically dependent upon companies from other countries, that is, of course, as long as it decides that it is in its best interest to allow things to remain this way. On the many occasions I've had to visit Germany, I've always had the strange sensation of being in an anachronistic place — future and past seem to lie side by side, and the present seems absent. I observe this because I believe it in some way serves to explain why Germany could not create a computer industry of its own large enough to dominate its own marketplace.

On the one hand, its science is so strong that some of IBM's most successful products were developed there. On the other hand, the disposition of German industry to manifest almost fanatic resistance to replacing old systems provides us with

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Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Software quality: keys to success

QUALITY
Wayne Smith

At a recent conference on software quality, one of our associates began his presentation by asking how many companies had existing quality assurance groups. Between one-third and one-half of the 200 attendees raised their hands. Then, he asked how many had successful quality assurance functions; this time, only a handful responded.

It is apparent that there are a large number of existing quality groups in information services which are not perceived to be successful. To the extent that perceptions are reality, this represents a significant problem and an important management issue when attempting to install a quality program.

The problem is that the perception of the quality group by the people with whom it must deal is largely determined by often subtle and arbitrary aspects of the group itself and its behavior. Furthermore, this perception is frequently negative.

We have found that there are five overlapping and interrelated aspects of a typical quality program which contribute to the overall perception of the function by the organization. These aspects are the quality organization, the capabilities of the staff, training, the quality process and human factors.

The type and location of the quality organization itself obviously influences the perception of the people who deal with the quality group. It will be perceived negatively if, for example, there is no organization or it is not located properly in the hierarchy. People tend to form negative perceptions when they are being asked to respond to a process which initially they feel is a burden to them if they sense the company is not committed. Further, it is important that the quality organization and its mission are spelled out clearly as part of company policy and have a well-defined charter.

The background and qualifications of the quality group's staff is also influential in shaping perceptions. The quality group must be staffed with relatively senior people who have the clear respect of their associates and who have a history of success. A negative perception is only one of the conclusions drawn by the organization when it sees that the quality assurance group is staffed with people who have not demonstrated their expertise on past projects and who have no apparent credentials for being in a position of assessing someone else's work.

The third aspect of the quality program which has been found to shape perceptions is the associated training program. Many quality functions are perceived poorly because the quality program has not been institutionalized in the organization. To implement properly a quality program and to provide a foundation on which solid, positive perceptions can be developed, an extensive training program must be put in place. This training should begin early, even before the quality program is fully installed.

This training not only shapes the initial impressions of the program, but also begins to define in realistic terms their expectations regarding the entire process. In addition, the training sessions can serve to refresh and reacquaint the

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Smith is vice-president, specializing in quality, at Applied Information Development, Inc. in Oak Brook, Ill.

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the impression that for Germans, modernization is something everyone else should do. The architectures that typify rebuilt German and Japanese cities provide silent testimony, in their contrast, to widely diverging viewpoints on the future between the two countries. Japan produced ultramodern cities of the future; Germany reproduced the cities of its past. Its indigenous computer industry will stand a better chance of self-determination if it follows the lead of the U.S., and soon Japan, in deregulating its communications [CW, March 7].

By the time *Tsunami* was begun, I had traveled abroad more than 100 times, worked in many countries and had the opportunity to meet many foreign computer industry scientists in their laboratories. I saw emerging an ever-increasing competency in computer systems design and manufacture, especially in Germany and Japan. This, occurring precisely at the same moment that the benefits of large-scale integration were being realized, indicated to me that the terribly high cost of competing for marketplace share was soon to be overcome. I knew that this would inevitably lead to a diminution of our foreign opportunities and the emergence of foreign competition at home. I wondered how our computer industry might fare as the situation ripened.

During those days, we were being exhorted to economize and increase our productivity, it having apparently gone to hell without our feeling a thing; we woke up one day only to discover that our productivity had dropped below that of the British — although I personally felt I was working harder than the Japanese. I wondered if it might be possible that the same fog that enveloped us to allow this to happen might visit us again. And whilst we were in it, might not our computer industry be spirited away from under our very noses?

You could believe anything was possible if you lived through 1978-1979 in this country. Iran, Afghanistan, science agreements canceled, an Olympic boycott, all-time highs in interest and inflation and an attack on our president by a rabbit stick in my mind as characteristic of the times. With surprises the likes of these going on, someone is likely to be in the vault, history teaches us. I raced to check it out, but there was no one there but ourselves. And I abandoned *Tsunami* — fast.

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staff with the techniques and methods that are vital to the true effectiveness of the entire process.

The fourth aspect of a quality program that tends to influence perceptions is the content of the actual quality process itself. That is, the collection of methods and procedures by which information services management builds and buys quality data processing systems. This process must not aggravate or accentuate the already natural confrontational tendencies that exist when any group feels its work products are being assessed by someone else. In fact, the process can be helpful in mitigating this situation by emphasizing the principle of concurrence.

The principle of concurrence should underlie the entire quality process. It holds that while for each project there is only one project manager and that person is fully authorized to manage the effort, the quality group is jointly responsible with the project manager to ensure that all important quality issues are being addressed and that all project risks are properly identified and managed.

Important principle

This is an important principle because it influences the perceptions of the project team especially. The proper implementation of the principle of concurrence will ensure that the process itself does not manufacture confrontations as is so often the case, but rather serves to guide the resolution of the inevitable disagreements along a well-defined and mutually agreeable sequence of steps.

In addition, this approach serves to minimize effectively the perception of the quality group as simply a keeper of the faith or defender of what is good, but not as a group that has any real accountability for the success or failure of the efforts themselves. The principle of concurrence together with the concept of joint responsibility will tend to ensure that the quality group assists the project effort with constructive suggestions for improvement and not simply potshots.

Finally, and perhaps most importantly, the human factors exhibited by the quality group staff tend to be especially critical in the formation of perceptions by others in the organization. If all the other aspects of the quality program are satisfactorily managed, the quality program can still be perceived negatively if the manner and style of the quality staff is not properly enlightened. It is important for the quality group to understand that quality is truly everyone's responsibility and not under the special purview of those who are assigned to the quality function.

A prior column on quality identified the critical success factors of every quality program. The factors are commitment, organization and discipline. However, it is important to realize that these factors typically will require months of refinement and gradual assimilation. Moreover, in all organizations where the senior management has begun to take the proper steps, we see unsuccessful quality groups hiding behind what they see as a lack of management commitment in the program. Instead, they should perhaps critique their own efforts to ensure that their style and manner is not significantly contributing to the unsuccessful image.

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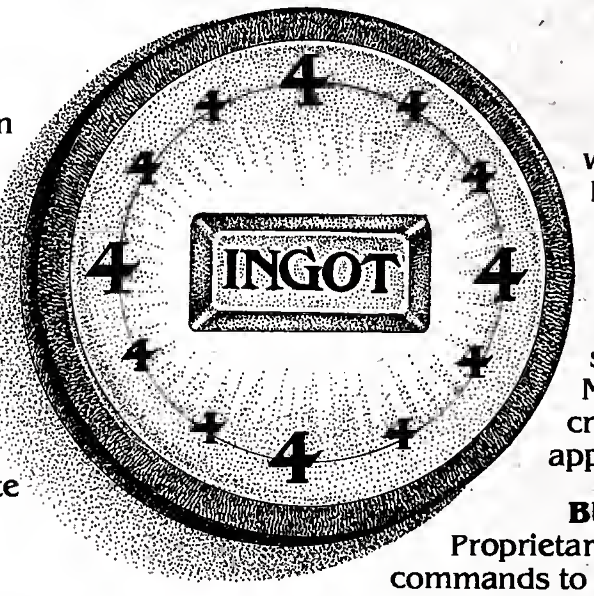

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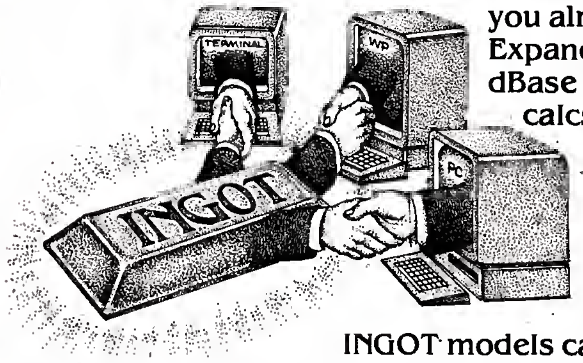

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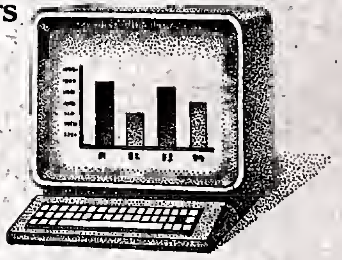

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Employee's self-pride seen as key to motivation

READER'S PLATFORM

Susan B. Romero

How many times do we take 10 steps outside of our own organization to observe and define our company's culture and employees? We may not like the results, but that is the only realistic way to design and implement management styles and programs that motivate and recognize employees. We are usually too busy running in between meetings and fighting fires to find out about our environment.

After working almost 10 years with data processing personnel and trying to design motivation and recognition programs, I was determined to find out why certain types of employees are motivated by different management styles and programs. I asked the following basic questions to 10% of our employees.

1. Why do you work?
2. What motivates you to do a good job?
3. What motivates you to go above and beyond?
4. What is the most demotivating thing that has happened to you, preferably at our company?
5. What type of recognition works for you?
6. What are your career aspirations?
7. Explain our company culture.
8. Is our company a "winning" company?
9. Describe our employees.
10. If you leave our company, what would be the circumstances?
11. What is the worst thing we could do at our company to create dissension?

Diverse group of employees

I interviewed a diverse group of employees: highly technical employees, those who had been with other companies prior to coming to our company, newly discovered managers with high potential, old-timers with years of experience and from the school of hard knocks, young college recruits, females, males, minorities, employees raised in different geographic areas and on and on. The most valuable part of my research was talking to our employees and realizing how well the pieces began falling into place.

Based on responses, I was able to crystallize the definition of our culture, discern which employees work well in it and which do not and why, find the basis of their motivation and what types of recognition really work.

I finally answered the most important question. Motivating DP personnel is no different from motivating employees in other professions. No matter what type, level or background of employee I spoke with, the primary motivation was a desire to perform well, based on a self-pride instilled at childhood. It is also important to recognize that it really does not take monetary programs or a lot of hoopla to recognize employees. Very private encouragement and rewarding opportunities particularly designed for the individual are the key.

I grouped our employees into four areas. Of course, all employees had attributes in each of the areas, but based on the majority of the responses, I developed trends into specific groups. No matter how many additional employees I interviewed, the employee resembled one of these groups.

Group 1 includes our highly technical employees. They are basically self-motivated, have self-imposed high standards and are most motivated when they have the freedom to do their assigned projects the way they desire. This freedom allows them to grow technically. They define our company culture as being very short-term-oriented and full of average employees who want to do a good job.

The highly technical employees have mixed feelings about whether our company is a winning one. They prefer recognition that is private. Recognition is most meaningful to them when it comes from their technical peers (only a handful) or from technical managers who know what it is they are doing. Their sense of recognition is strongest when they know for themselves that their system has been implemented with no glitches. The employees in this group will probably leave the company if they feel their freedom is being stifled.

Group 2 comprises those who want to go into management or climb further up the management ranks. As in the other groups, these employees are mostly motivated by self-pride. In addition, they are goal-oriented, desire to do something worthwhile and meaningful and are also motivated by peer pressure. They definitely feel they are working for a winning company and also feel the company is full of highly motivated employees.

Peer recognition is most important to them, followed by recognition from senior management (preferably

---

Romero is employee relations officer of United Banks Service Co., the data processing subsidiary of United Banks of Colorado, Inc., Denver.

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> *Motivating DP personnel is no different from motivating employees in other professions. The primary motivation is a desire to perform well, based on a self-pride instilled at childhood. It really does not take monetary programs or a lot of hoopla to recognize employees. Very private encouragement particularly designed for the individual is the key.*

in writing) and then from their subordinates. Some also like the idea of team recognition awards.

It was intriguing to interview the employees in Group 3. All of them had previously worked for at least one other organization. Depending on the size, location and type of their previous employer, their responses were very different. They, too, are highly self-motivated, due to self-pride, and like an environment in which they can continuously grow and learn. Our company is viewed as a winning company by 50% of these employees. This group describes our company as having a mix of all types of employees, just like any other organization.

Most feel, especially if they came from a large organization, that our company is technically behind. They prefer recognition in private — pats on the back in terms of mutual respect — either from peers, management or their users. Employees in both the second and third groups plan to leave our company if their next career step is not in the foreseeable future or if their learning and technical growth is stifled.

Employees in Group 4 are mainstays of the organization. They average 10 to 15 years of service and have been performing much the same function for years. In addition to self-pride, they are motivated by financial rewards. These employees like very much to be part of the winning team and consider our company a winner.

They enjoy their job security and would be devastated if the company had any layoffs. They feel they are being recognized if they are given more responsibility and authority in performing their current job. Interviewing these employees was both important and enlightening. Because of their years of service, they had a lot of perspective and history about our company's evolution.

I found that all employees are basically motivated by a self-pride instilled during childhood. They are not solely motivated by their performance reviews and increases, working conditions or benefits, but these factors are important if not fairly and competitively administered.

Recommended management styles

Based on these findings, I then recommended management styles and practices and personnel programs to motivate employees further in our company culture. The following are the recommendations separated by each employee group.

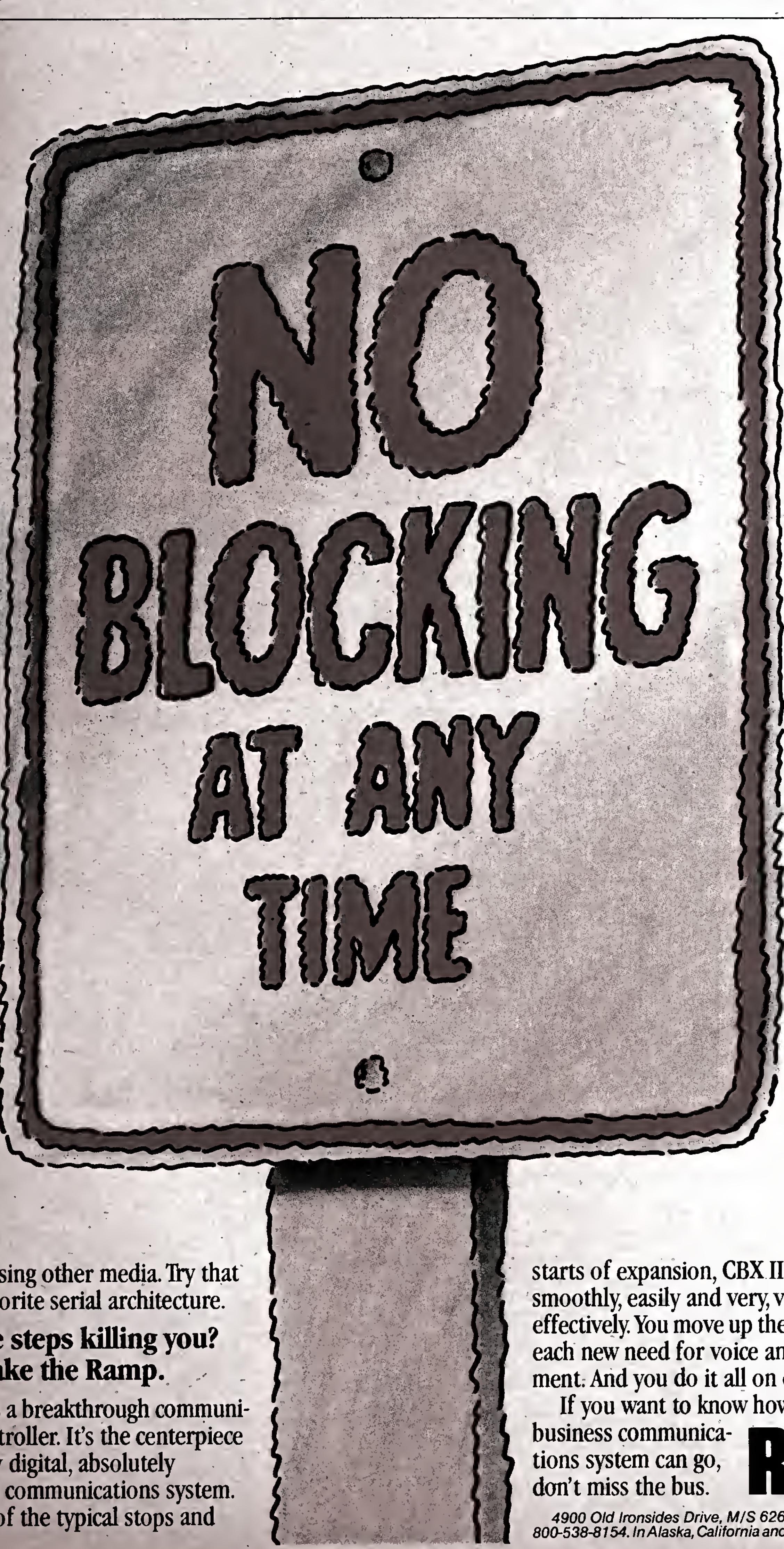
■ Group 1: Managers should permit these employees as much freedom as possible to perform their responsibilities in ways consistent with the goals of the organization. These employees should provide input to the company's long-term strategic direction in planning activities.

■ Group 2: Experiment with a goal-oriented approach to recognition awards. Praise these employees. Use matrix management and various sessions to encourage peer pressure and recognition; try managers' meetings, planning sessions or brainstorming sessions. Assign these employees to projects that are meaningful and valued by the users (none of those "spinning-the-wheels" types of projects). Be very careful in promotion selection.

■ Group 3: Continuously update this group and offer company training resources that represent the state of the art. Try more frequent transfers between departments and more frequent changes of entirely different product/project assignments.

■ Group 4: Delegate more responsibilities and authority to perform the current job. Don't talk about layoffs.

Most important to all employees is a program that capitalizes on their self-pride. This program can sporadically, immediately and privately recognize various employees across the organization. In addition, pay attention to those so-called dissatisfiers and accurately reflect performance in reviews and develop fair and equitable administration of salaries, promotions and benefits.



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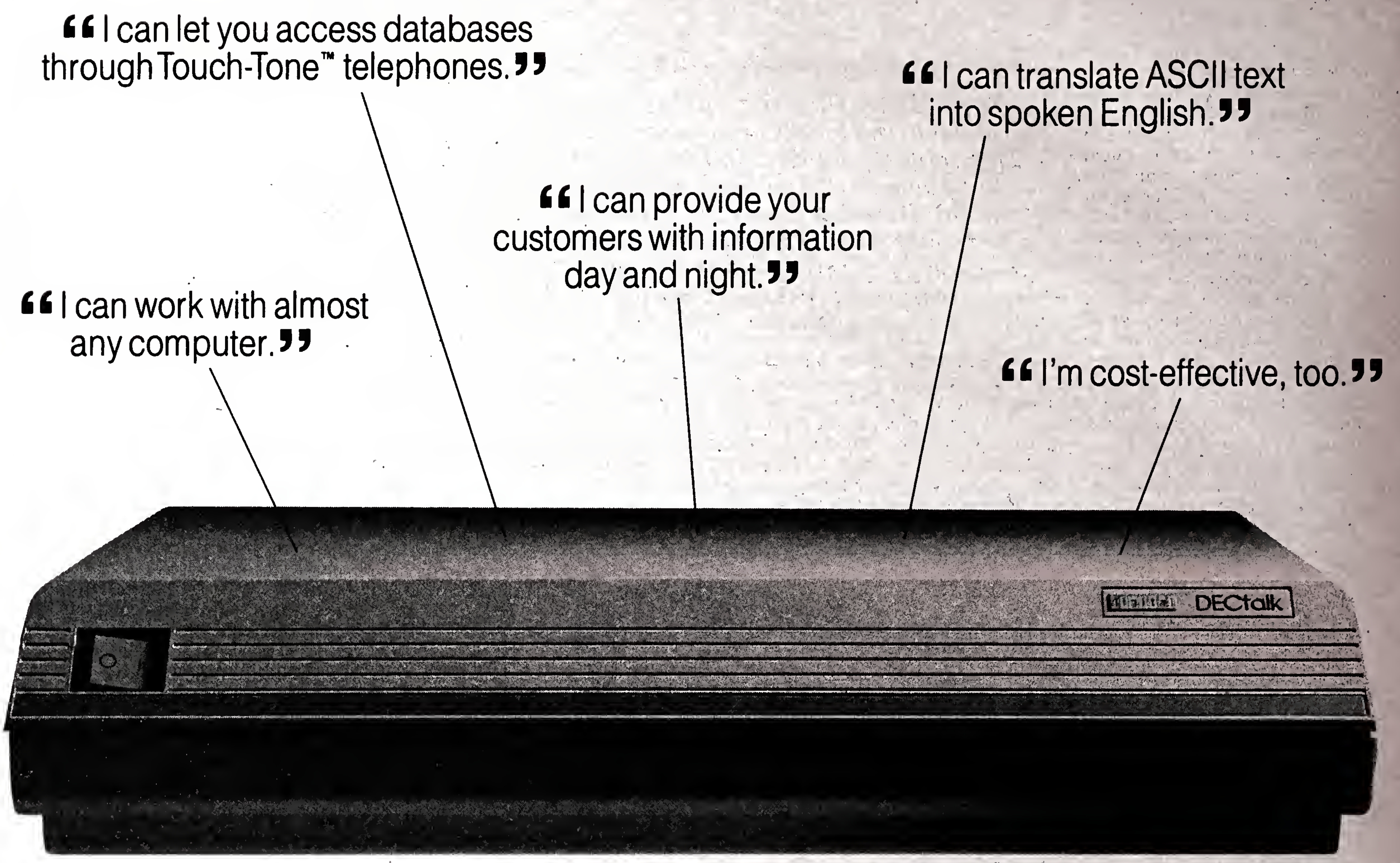
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The DECtalk unit synthesizes speech. It's a terminal that accepts computer output the same way a video terminal or printer does, with one revolutionary distinction: DECtalk "talks."

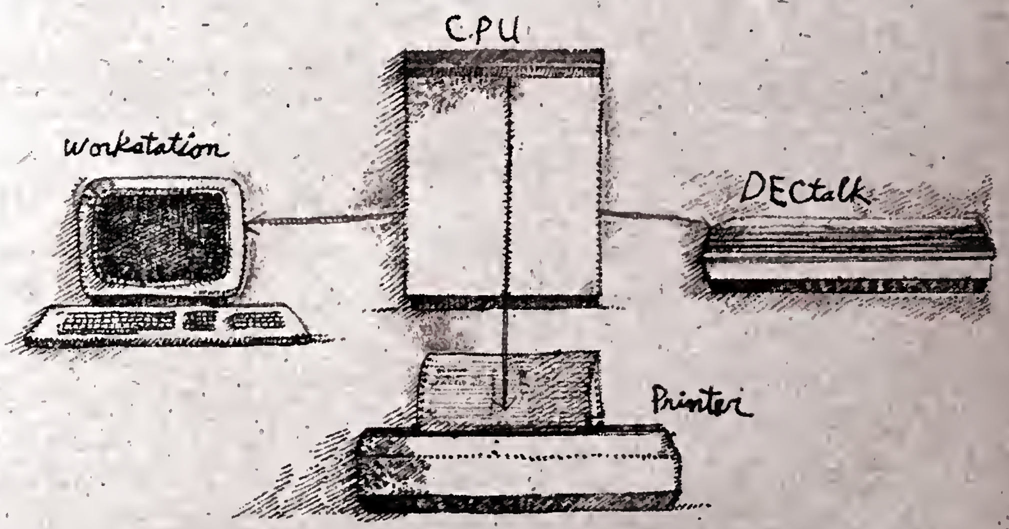
And it does it with a level of quality and economy that has never been achieved anywhere before. If you want to hear the information that you would otherwise need a display screen or printer to receive, integrate Digital's DECtalk system with your applications.

LISTEN TO WHAT OUR ENGINEERING HAS ACCOMPLISHED.

It's a natural idea to give computers the ability to speak English. So it should come as no surprise to learn that there are other systems that have pursued this idea. But there's nothing that even comes close to the DECtalk system. Consider all these standard features.

Instead of using pre-recorded words and phrases, the DECtalk system performs true speech synthesis in a unique, three-step process. First, it converts each word into digitized phonetic symbols. Then it adds inflection, denoting punctuation and the relative position of words within a sentence. Finally, it generates realistic speech output through the synthesizer unit.

Instead of a flat, undifferentiated monotone, DECtalk gives you a variety of easily-understandable, natural-



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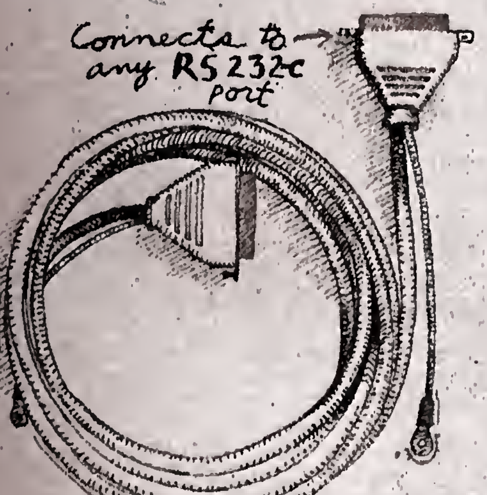
sounding voices, with modulated pitch, clear inflection, varying tones and selectable rates from 120 to 300 words per minute. You can choose from eight different speaking personalities, including male, female and children's voices. This lets you add emphasis to your message—using one voice for system prompts, for example, and another voice speaking at a faster rate to convey database information.

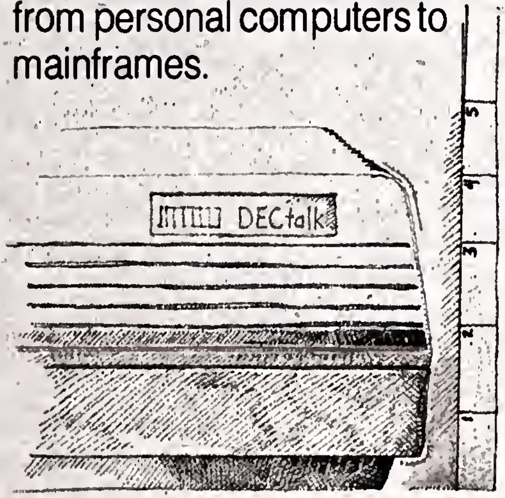
You don't have to restrict your vocabulary when you work with the DECtalk terminal, either. The system determines proper pronunciation by referring to its own internal dictionary and a set of letter-to-sound rules which can be applied to almost any word. You can add a special dictionary of your own for terms that are unique to your environment. As a result, the DECtalk vocabulary is extremely comprehensive.

Even that's not all, because we've engineered the DECtalk system with the ability to recognize words in context. For example, consider the difference between $1.75 and $1.75 million. Primitive systems would read this as "dollars-one-period-seven-five" and "dollars-one-period-seven-five million." The DECtalk system considers the context, and interprets these figures correctly as "one dollar and seventy-five cents," and "one-point-seven-five-million dollars." It also handles abbreviations properly. It will output "St. James St." correctly as "Saint James Street." In other words, you can hear it the way you would read it. No speech synthesis system has ever achieved this level of quality at such a low cost.


Connects to any RS 232c port

DECTALK WORKS WITH THE COMPUTERS YOU ALREADY HAVE. RIGHT NOW.

Any computer or word processor that generates ASCII alphanumeric text and uses an RS232-C port can use the DECtalk terminal. This includes every system Digital makes, as well as the vast majority of computers marketed today—from personal computers to mainframes.



Just as important as the fact that the DECtalk terminal works with almost any computer is the way it works with them: transparently. The DECtalk system is as easy to install as any printer or video terminal, because, to your computer, the DECtalk unit is just another serial output device. All the text-to-speech intelligence is embedded within the compact, briefcase-sized unit itself.

THERE'S NO END TO WHAT DECTALK CAN TELL YOU.

The DECtalk system allows you to use any standard Touch-Tone™ telephone as a computer terminal. It can provide speech output over standard telephone lines, and will respond to commands issued through Touch-Tone telephone keypads. The DECtalk system incorporates auto-dial capabilities, too, so your computer can use the DECtalk terminal to send spoken messages to users over telephone lines automatically.

In addition, the DECtalk unit has its own internal speaker, so it can stand alone or operate in conjunction with a workstation and keyboard. It can also use an external speaker or public address system. These speech output capabilities open up an incredible variety of applications.

As an adjunct to an electronic message system, for example, the DECtalk terminal can allow travelling managers and professionals to access their mail remotely from any Touch-Tone phone.

Salespeople can call up DECtalk services while in a client's office to determine order status, check a price listing, or note inventory balances.

Banks can use DECtalk systems to let customers call up their own account balances, without requiring assistance from clerical staff.

In a process control environment, a DECtalk terminal can add spoken status messages to the information portrayed in graphic displays and screen prompts. And that can make it a lot easier for operators to effectively monitor and respond to critical events.

The DECtalk terminal is a boon for the handicapped, too. It can give a vision-impaired person an effective, economical way to work with computers. And it can give a speech-impaired person a way to verbalize his or her thoughts in person or over the phone.

This just begins to suggest the applications for the DECtalk speech synthesis terminal. Its usefulness is limited only by your imagination.

THE PRICE IS EQUALLY AMAZING.

When you consider everything Digital's DECtalk system does—the way it provides database access through telephones instead of terminals, the unique quality of its voice output, its ease of installation, its compact, briefcase size, its compatibility with almost any computer, and the fact that there's no overhead because all the text-to-speech intelligence is contained within the DECtalk unit itself—the price may be the most amazing feature of all. The DECtalk system is available now for $4000* or less, depending on quantity.

In short, the DECtalk system makes computerized speech output both practical and affordable. And that makes the DECtalk speech synthesis computer terminal the best engineered computer interface you can buy for literally thousands of applications.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

The DECtalk speech synthesis terminal, like all Digital hardware and software products, is engineered to conform to an overall computing strategy. This means our systems are engineered to work together easily and expand economically. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

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SOFTWARE & SERVICES

SOFTALK
John Gallant
CW Staff

DP execs: Think before you link

"For fools rush in where angels fear to tread."
— Alexander Pope.

Microcomputer-to-mainframe link technology is one area in which DP managers should tread very carefully indeed.

Linking the two dominant hardware tools in use today is an attractive idea, and a certain amount of eagerness to embrace currently available products is understandable. The pressure from end users seeking access to up-to-date, live production data can be strong, even if those users cannot yet demonstrate a clear and compelling need for such access. And, as many DP managers can attest, the self-imposed pressure to maximize return on the corporate information resource and keep abreast of technological advances is just as intense.

But the micro-mainframe link is not a panacea, and the desire to hop aboard the link bandwagon should not overwhelm a DP professional's critical and analytical instincts. This is one area in which all the caution and discretion an information systems manager is paid to exercise should come to the fore. The decision to postpone the micro-mainframe marriage after careful review may or may not put your organization a strategic step behind its competitors. But the hasty adoption of a poorly designed or ill-fitting link will almost certainly be politically costly to DP and may serve to ostracize end users and top management alike.

Remember that whatever the price of the software itself, the implementation of a link on anything but a pilot basis will be expensive. Do not be swayed by a vendor's claim that a micro-mainframe

See **LINKS** page 49

ADR unveils 'Ideal' Release 1.1 for DOS/VSE environments

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Release 1.1 of its ADR/Ideal fourth-generation application development system, which makes the product available for IBM's DOS/VSE environment.

According to a spokesman, Ideal was previously available for IBM MVS and VS1 environments. In addition to making Ideal compatible with DOS/VSE, Release 1.1 is said to feature performance and functional enhancements.

Release 1.1 reportedly improves the system's reentrant capabilities and reduces memory requirements and I/O overhead. The spokesman said application performance improvements in large networks can be achieved by marking applications as shareable, requiring only one copy in memory for many users; or as resident, eliminating program loading for high-activity applications.

Functional enhancements include greater data base flexibility, improved execution of on-line Ideal applications under IBM's CICS, provision for more detailed accounting of on-line Ideal programs and the ability to program application security at the user and terminal levels. Data base flexibility has been enhanced by permitting dynamic selection of identically defined data bases where a test and production version or partitioning by location is convenient.

The spokesman said that for users of on-line Ideal applications, application sign-on and the ability to schedule both Ideal and non-Ideal transactions under CICS enable the Ideal runtime environment to appear as any on-line service.

Release 1.1 of Ideal is available under CICS/VS for DOS/VSE, OS/VS1 and OS/MVS environments under IBM 370, 30 and 4300 series processors. The permanent license price for Ideal is $50,000 for DOS environments and $82,500 for OS environments. ADR is at Route 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Programming has wide DP application

SOFTLINE
Debra Zahay

Three and a half years ago, I was a newly minted MBA with a concentration in MIS and a burning desire to save the world from information overflow.

It took about six months of working in a large corporate data processing organization for me to realize that I needed some technical background if I was going to be more than a casual participant in the systems development process. I made the decision, aided by several supportive managers, to learn how to program.

Even with my relatively small amount of work experience, the transition to programming was difficult. I went from the position of project leader on a nontechnical assignment to programmer on a large systems development project. With the help of video classes and a very patient project leader, I set about my objective with less than wild enthusiasm.

It was a frustrating experience initially. There were two hundred compile errors in my first program because I started my code in column seven instead of column eight.

But I did it. By the end of seven months, I had moved into a position of checking over the work of other programmers. A few months after that, I

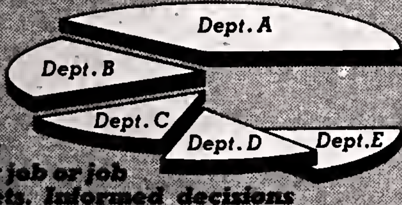
See **MBA** page 49

Zahay is a consultant for Interactive Data Corp., a division of Chase Manhattan Bank, in Chicago.

- Tower Systems International, Inc. has added word processing and color graphics, among other features, to its Omnicalc mainframe spreadsheet/**45**
- Relational Technology, Inc. has released a version of its Ingres data base management system for supermicrocomputers under the Unix operating system/**44**
- A new package of data base development tools for users of Cullinet Software, Inc. products has been announced by ETA International, Inc./**44**
- Precision Visuals, Inc. has added a graphics software development package based upon the Graphics Kernel Standard/**45**

INSIDE

Systems Software/**46**
Productivity Aids/**46**
Application Packages/**46**



OS/MVS-VS1 USERS: How to Distribute DP Expenses Equitably to User Budgets.

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Relational Technology unveils 'Ingres' for supermicros

BERKELEY, Calif. — Relational Technology, Inc. (RTI) has announced Ingres/Compact Systems (CS) Version 1.0, which is said to be a supermicrocomputer version of its Ingres relational data base management system (DBMS).

According to a spokesman, Ingres/CS is currently available for AT&T Information Systems' 3B2 multiuser computer. Ingres/CS is written in C and integrates the relational DBMS with a set of RTI's "forms-based" visual programming tools.

The tools are designed to allow end users to develop applications without programming, a spokesman said. They include full-screen forms definition and editing, query update and report generation. A high-level definition language for the creation of more complex reports is also included.

Ingres/CS is said to provide an English-like data base language, dubbed Quel, which lets users define and manipulate large data bases that are viewed as tables. The spokesman said that using Embedded Quel for the C language (Equel/C), application builders can integrate Ingres data base access and forms control with programs written in C. The Equel preprocessor is said to simplify the creation of menu-driven, forms-based applications.

Relational Technology is located at 2855 Telegraph Ave., Berkeley, Calif. 94075.

Computer Associates offers demo

JERICHO, N.Y. — Computer Associates International, Inc. has released a demonstration package for its CA-Executive integrated software product for IBM Personal Computers in an IBM mainframe environment.

The package includes a demonstration diskette, an audio tape and a handbook. The diskette demonstrates the use of CA-Executive's window manager, data base management and related programming facilities; word processing, graphics and other integrated applications; and a microcomputer-mainframe link, a spokeswoman said.

Over 12,000 demonstration kits have already been distributed. The base price for CA-Executive is $1,295 per copy for a minimum of five copies, with quantity discounts available. The micro-mainframe link is included at no extra cost.

Demonstration kits are available from Computer Associates, 125 Jericho Tnpk., Jericho, N.Y. 11753.

System tool out from ETA

NEWTON, Mass. — ETA International, Inc. has announced the Data Based Development System (DBDS) for users of Cullinet Software, Inc. products.

According to a spokesman, DBDS is a set of tools and techniques to facilitate various steps in the data processing system development life cycle.

It is composed of the Data Based Development Aid (DBDA) and the Data Based Development Methodology (DBDM), both of which are designed to operate in Cullinet's IDMS environment with its Integrated Data Dictionary.

The DBDA is a system of Cullinet Application Development System/On-Line dialogues that provides cataloging and cross-referencing of all business entities and functions in a project development effort.

The DBDM is a comprehensive methodology for systems development that gives detailed instructions and "deliverables" for each phase of a project life cycle, the spokesman said.

DBDS is priced at $28,000 from ETA International, 7 Wells Ave., Newton, Mass. 02159.

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ISI software is versatile, too. It's designed to run on all IBM mainframes, the IBM System/38 and Prime. ISI supports data base and data communications environments including IMS, ADABAS, DATACOM, IDMS, VSAM and CICS, IMS DC, ADS/on-Line, NATURAL and IDEAL.

Call us. We'll answer your questions with the kind of straight talk and hard information it takes to make informed decisions. We think you'll see why Datamation Magazine ranks ISI number one in payroll/personnel software.

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locally and in Canada (415) 939-3900.

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Tower Systems adds graphics, WP to Omnicalc

IRVINE, Calif. — Tower Systems International, Inc. has announced the addition of color graphics and word processing support and an Interactive File Interface to Release 5 of its Omnicalc mainframe spreadsheet package.

According to a spokesman, the Omnicalc spreadsheet package runs on IBM or compatible mainframes under IBM's CICS, VM/CMS or TSO.

Release 5 enhancements reportedly increase spreadsheet dimensions to 255 columns, 255 planes and more than 32,700 rows. The VM/CMS versions now support up to 58,000 cells. The spokesman said that lengthy formulas can be entered interactively into a cell from the command line without increasing cell size. The system also offers additional built-in functions for arithmetic, string handling, financial, statistical, trigonometric and special functions that perform calculations automatically.

The Interactive File Interface feature is said to provide users with online access to IBM Vsam and CMS files, and an added template lets users display file characteristics and select file options with single keystrokes. The word processing and color graphics support enhancements help users create reports complete with tables, charts, graphs and text. More than 30 varieties of graphics display may be used, including pie, line charts and surf charts, histograms and Venn diagrams.

Lease prices begin at $300 per month. Tower Systems International is located at Suite 365, 19782 MacArthur Blvd., Irvine, Calif. 92715.

Precision Visuals unveils GK-2000

BOULDER, Colo. — Precision Visuals, Inc. last week announced a graphics software subroutine library that implements and adds features to the Graphics Kernel Standard (GKS) international standard. The product runs on IBM mainframes under IBM's VM and MVS operating systems, Digital Equipment Corp. VAX-11 computers and most processors running the Unix operating system.

The new package, GK-2000, is compatible with the full complement of Precision Visuals device-intelligent drivers, enabling it to support up to 80 graphics peripherals, a spokesman said.

GK-2000 includes more than 190 user-callable subroutines that can be used to create device-independent two-dimensional applications. The interactive package supports up to 11 concurrent device drivers, 24 stroke-precision fonts, 256 line types and a range of input devices.

The basic version of GK-2000 will be available in the fourth quarter of 1984, with an extended version planned for release in early 1985. Pricing varies from $4,500 to $21,000, depending on CPU.

Precision Visuals is located at 6260 Lookout Road, Boulder, Colo. 80301.

Systems Center unwraps enhanced NDM

SAN MATEO, Calif. — Systems Center, Inc. has announced Release 2.0 of its Network Datamover (NDM), which is said to allow on-line movement of programs and data between microcomputers, minicomputers and mainframes in a network.

According to a spokesman, the enhanced release features full partitioned data and library support, remote unattended operation, improved security and audit capabilities and support for the NDM on the IBM Personal Computer. NDM runs under IBM's MVS operating system and is said to distribute applications, data and documents throughout a network.

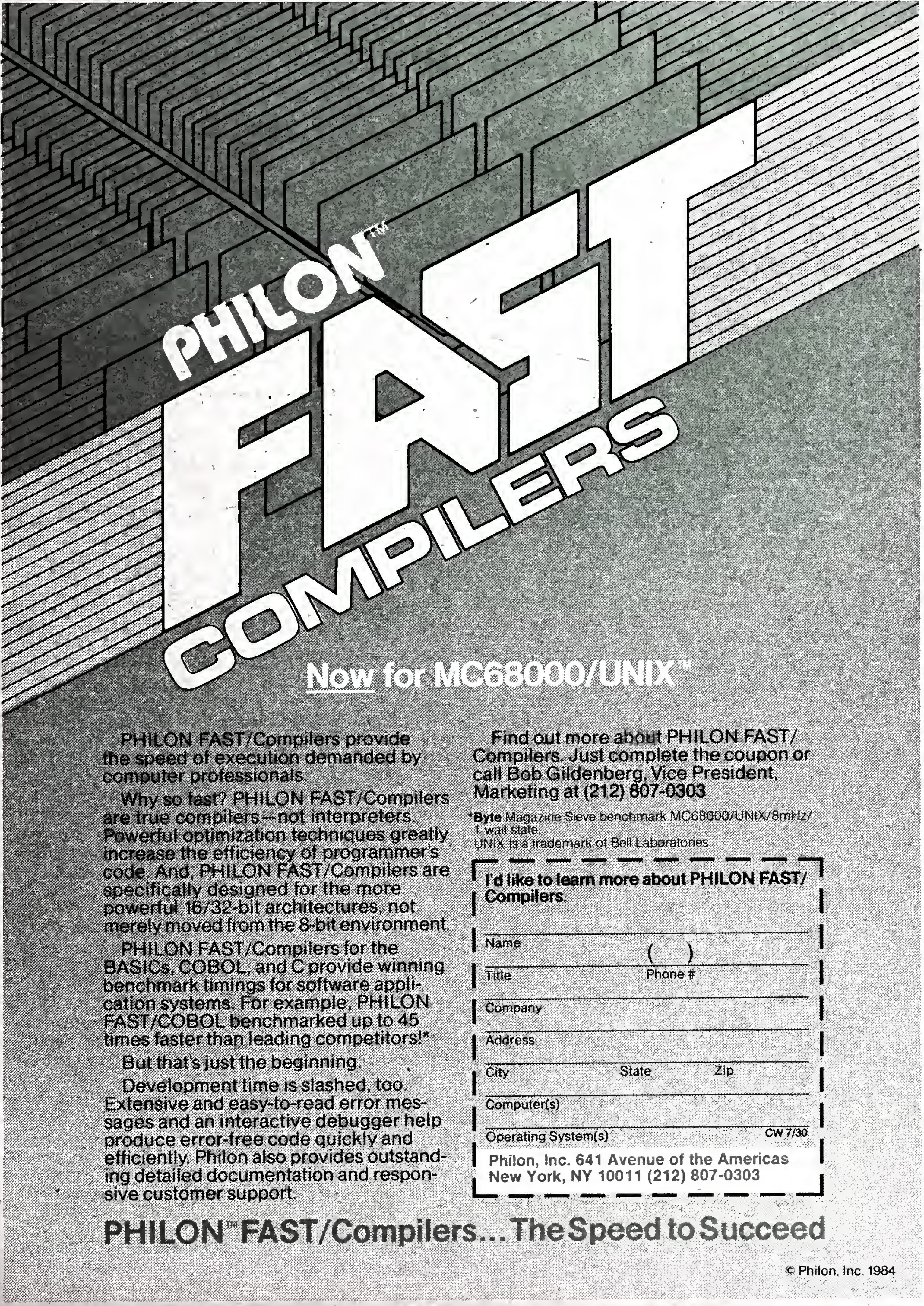
The spokesman said NDM can facilitate information and application transfer between mainframe and micro, mainframe and mainframe and between mainframe and mini. It reportedly handles electronic mail and electronic distribution of documents through the network, performs information collection and distribution throughout a network and allows for the storing of data at a workstation before it is forwarded to another point in the network.

NDM is said to allow a user to manipulate data or programs via menus from a micro, and information traffic can be initiated automatically via the system's scheduling facilities. Data can be transferred anywhere in the network at a predetermined time.

NDM Release 2.0 offers hierarchical information distribution and management, full partitioned data set load module support for load libraries, distributed workstation support using the Personal Computer as a distributed processor, remote "operator-less" operation for micro-mainframe interaction and full access to mainframe subsystems such as IBM's CICS and IMS.

Release 2.0 costs $35,000 for the first site, $25,000 for the second site and $20,000 each for the third and fourth sites. Software for the Personal Computer costs $500/unit.

Systems Center is located at 2988 Campus Drive, San Mateo, Calif. 94403.



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*Byte Magazine Sieve benchmark MC68000/UNIX/8mHz/1 wait state
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SYSTEMS SOFTWARE

BOOLE & BABBAGE, INC.
Release 1.1.3 IMS Management Facilities

Boole & Babbage, Inc. has announced Release 1.1.3 of its IMS Management Facilities (IMF) performance monitoring and management software for IBM's IMS data base management system (DBMS).

According to a spokesman, enhancements to IMF components have been made to provide additional capabilities for troubleshooting IMS performance problems. The Trace Service of the IMF/Workload Analyzer (IMF/WA) can now report on the program scheduling event, permitting early detection of bottlenecks that postpone the beginning of IMS transaction processing. Additional work load selection parameters have also been added to the work load wait and trace services of IMF/WA.

The spokesman said the Workload Wait service of IMF/WA can now detect 10 additional wait states, including IMS Resource Lock Manager wait and synchronous I/O active and queued in the IMS control region.

Installations must run IBM's MVS or MVS/XA and operate Version 1 of IMS/VS. Individual components are priced between $13,000 and $28,500 for a perpetual license.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

How Marvin Schumer and Kalman Shor

Made The Micro To Mainframe Connection

Marvin Schumer (left) is the DP manager for **EIC/Intelligence, Inc.**, the leading online database service and a major company in the fields of robotics, genetic engineering, energy and the environment. Kalman Shor (right) vice president of **K.M. System Support,** is EIC's communications expert.

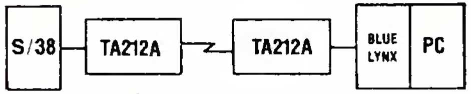
Marvin and Kalman had a timing problem to contend with: their office building (located in Mid Manhattan) closes at 7 p.m. sharp.

"We were cut off from our IBM System/38 on evenings and weekends. As programmers we were frustrated." BLUE LYNX™ made the affordable difference.

"Our programmers now each have BLUE LYNX-equipped IBM Personal Computers at home," Marvin says. *"They can now do program development at night and on weekends."*

Since the S/38 runs under Release 4.1 of CPF, his crew wrote its own program to pick up dropped lines for optimum unattended operation. (Note: Under release 5.0, lines recover automatically.)

A typical EIC/Intelligence configuration:



Use of PC's with BLUE LYNX won't be limited to the firms DP staff. *"All sales people will be getting into this program."* Marvin says, *"for customer inquiries and sales-call analysis."*

"The technical support from Techland has been excellent," he adds. *"BLUE LYNX was installed in April, after we evaluated alternatives including protocol converters. Our second BLUE LYNX took 5 minutes to install."*

5251/12 Emulation for S/34, S/36 & S/38 – $745
*3276 Emulation SNA/SDLC or Bisynch – $795
Bundled with KeyLynx, a 122 key, keyboard-$1190
*ETU – Emulator Transfer Utility allows upload and download of files – $500, $600 & $875
VTERM – Asynchronous Communications and DEC VT-52 and VT-100 Emulation – $125
MULTILYNX Port Expander – $1990

*Now includes Data Reader

BLUE LYNX 5251 is a joint development of Software Systems, Inc. Jefferson City, Missouri & Techland 7/84

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PERTEC COMPUTER CORP.
Unisoft Unix System V

Pertec Computer Corp. has announced that the Unisoft Systems Corp. version of the Unix System V operating system is now available on Pertec's Motorola, Inc. MC68000-based System 3200 family of business computers.

According to a spokesman, Pertec's Unisoft Unix System V is a standard version of Unix. It is available on the System 3200 desktop Model 3215 and the floor cabinet Models 3230 and 3240. The systems offer memory capacities ranging from 512K bytes to 4M bytes and hard disk storage from 26M bytes to more than 400M bytes. Applications written for Unix System V will now run on the System 3200 family.

Pertec's Unisoft Unix System V is composed of the Unix kernel, a file system, a C shell, a C compiler and more than 150 commands and subsystems for programming, editing, text formatting, communications and system administration. It also features University of California at Berkeley Unix 4.1 enhancements, including a visual editor, pagination commands for CRT terminals, a program and documentation locator and a terminal-independent library.

Prices for the System 3200 family with the Unisoft Unix System V operating system start at $12,000.

Pertec Computer, 17112 Armstrong Ave., Irvine, Calif. 92713.

SOFTSYSTEMS, INC.
OLS 2.0

Softsystems, Inc. has announced OLS 2.0, a new version of its on-line security manager, which provides security for IBM's CICS/VS product.

In the new version, operators assign their own passwords, a feature the company said provides greater security when access to CICS is allowed with a particular signon. Gaining access to CICS must be a two-step, two-person process, a spokesman said: The security administrator provides the operator with a signon name, and the operator selects and enters a password.

OLS 2.0 now has the ability to deny access to specified terminals during certain times of the day. For instance, a terminal that has access to sensitive data such as payroll information can be locked out of using any CICS transactions outside of business hours. All information in the security files of OLS is encrypted.

OLS 2.0 is available on a permanent basis for $5,500 for IBM's DOS/VSE or $6,500 for IBM's OS/VS1 or MVS.

Softsystems, 311 Mallick Tower, One Summit Ave., Fort Worth, Texas 76102.

DATA GENERAL CORP.
SM Basic

Data General Corp. has introduced a software emulator for MAI Basic Four Corp.'s implementation of the Business Basic programming language.

Called SM Basic, the emulator is said to give users the capability to convert Basic Four applications to DG systems.

SM Basic provides a set of menu-driven utility programs to aid in the conversion of programs and data files, which can be moved to the vendor's systems on tape or diskette or by transmitting them from Basic Four hardware to DG hardware, the vendor said.

SM Basic operates on the vendor's full line of systems, from Desktop Generation microcomputers to Eclipse/MV minicomputers. It is available for the vendor's AOS, AOS/VS and AOS/WS operating systems.

Prices are $7,000 for an AOS/VS one-time license, $5,400 for an AOS one-time license and $900 for an AOS/WS right-to-use license.

Data General, 4400 Computer Drive, Westboro, Mass. 01580.

BOSTON SYSTEMS OFFICE
BSO/COM-2

Boston Systems Office has announced a communications program designed to help generate microprocessor programs on Digital Equipment Corp. VAX-11 superminicomputers.

BSO/COM-2 is said to be a high-speed, asynchronous, bidirectional communications facility that permits transfer of Ascii and binary files between VAX-11s and the Intel Corp. Intellec Series II and III microprocessor development systems.

Prices start at $1,900.

Boston Systems Office, 469 Moody St., Waltham, Mass. 02254.

SYNTAX SYSTEMS, INC.
VMS Ethernet Server

Syntax Systems, Inc. has introduced a software interface said to allow Digital Equipment Corp.'s VAX-11 superminicomputers running DEC's VMS operating system to function as file servers in 3Com Corp.'s Ethernet series local-area networking system.

The VMS Ethernet Server reportedly allows VAX-11/VMS computers to network with IBM Personal Computers and compatibles.

It runs on VAX-11/730, 11/750 and 11/780 models. First shipments are scheduled for September. The price is $7,500, the vendor said.

Syntax Systems, Suite N107, 6642 S. 193rd Place, Kent, Wash. 98032.

COMPUTER TOOLWARE, INC.
VTS/Imas

Computer Toolware, Inc. has announced VTS/Imas, a communications package that allows Hewlett-Packard Co. HP 3000 minicomputer terminals and IBM Personal Computers to emulate IBM 3270 series terminals.

The product reportedly features multiple key sets and 16 functions per key set. VTS/Imas reportedly includes enhanced response time through character terminal handling, automatic dialoguing to and from a mainframe and automated port and device selection. The software supplies file transfer capability from the HP machine. Its Suspend function is said to permit concurrent interaction with HP and IBM applications.

VTS/Imas costs $7,500.

Computer Toolware, 4227 Monroe St., Toledo, Ohio 43606.

CANDLE CORP.
Peformance Audit Services

Candle Corp. has announced a service designed to provide technical assistance to its customers conducting change, batch and IBM TSO audits utilizing Candle's Epilog/MVS performance management system for IBM MVS users.

Called Performance Audit Services, the complementary service provides technical assistance to Epilog/MVS users to answer questions, help solve MVS performance problems and aid users in designing and implementing an audit. The service is offered by Candle's technical support department.

Technical Support Department, Candle, Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

PRODUCTIVITY AIDS

MEGATEK CORP.
Nova*GKS

Megatek Corp. has announced the addition of the Nova*GKS (Graphics Kernel System) graphics application development tool to its family of graphics software programming products.

According to a spokesman, Nova*GKS was developed by Nova Graphics International Corp. and is an implementation of the GKS standard adopted by the International Standards Organization and the American National Standards Institute. Nova*GKS will be interfaced with Megatek's library of more than 125 device drivers, the firm said.

Nova*GKS will be available in two compatible versions. One version operates on Digital Equipment Corp.'s VAX-11 superminicomputers and is written in Fortran. The other, a microcomputer version, is said to operate with most 16- or 32-bit micros and is written in C.

Shipments of Nova*GKS from Megatek are scheduled for the fourth quarter. It will be priced at $10,000.

Megatek, 9605 Scranton Road, San Diego, Calif. 92121.

APPLICATION PACKAGES

MCBA
Payroll

MCBA has announced a payroll program written in Cobol for Digital Equipment Corp.'s VAX-11 superminicomputers.

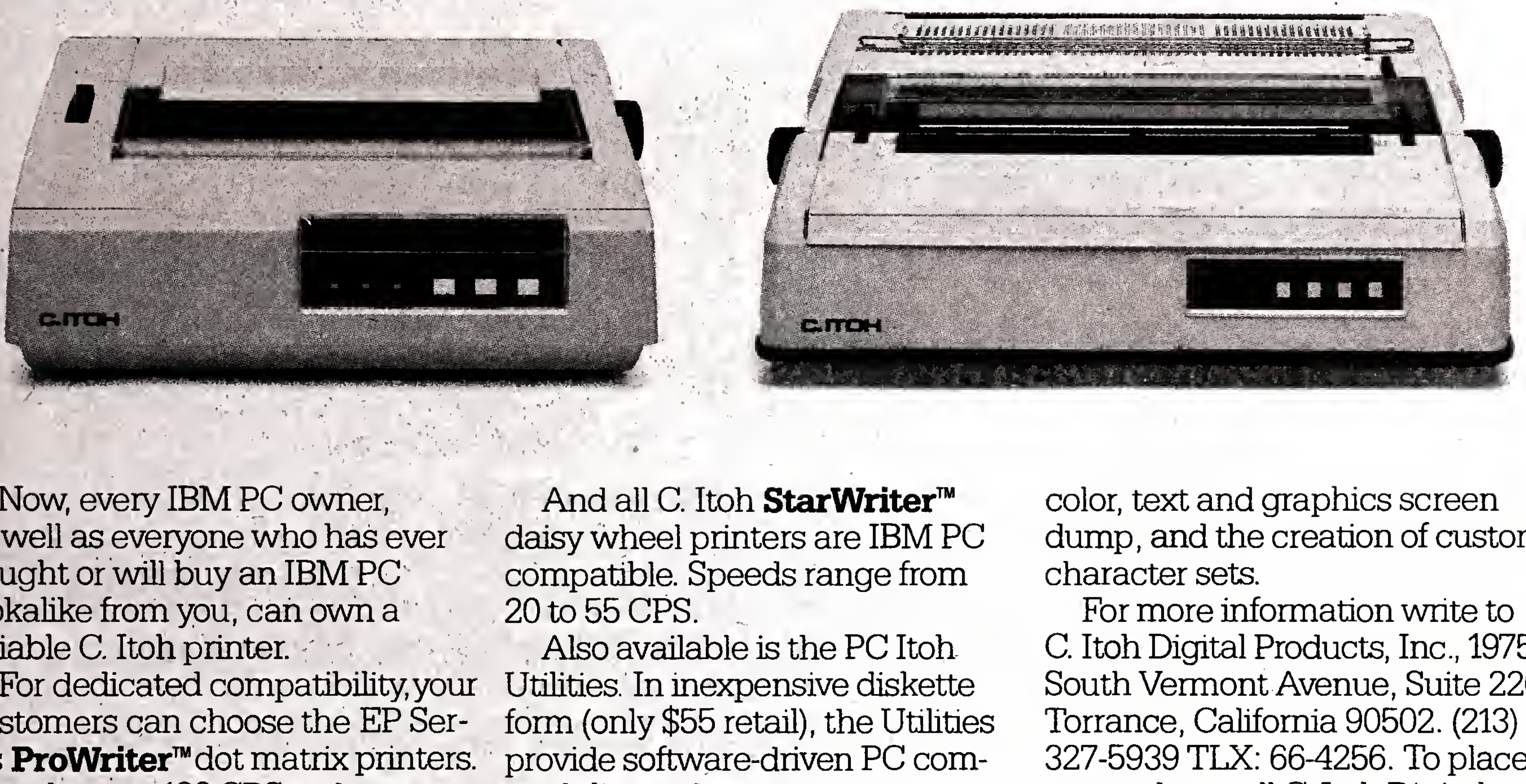
Payroll is said to be capable of accessing employees' records by either number or partial name. It allows up to 13 taxable or nontaxable earnings and deductions for both hourly and salaried employees, the vendor said.

The program is said to process manually written payroll checks and adjustments and to provide for check reconciliation.

According to the vendor, Payroll automatically generates a standard

Continued on page 48

Over one million IBM PC owners can now own printers as good as their PCs.



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Also available is the PC Itoh Utilities. In inexpensive diskette form (only $55 retail), the Utilities provide software-driven PC compatibility and more.

The "and more" includes the ability to print Lotus 1-2-3® in full color, text and graphics screen dump, and the creation of custom character sets.

For more information write to C. Itoh Digital Products, Inc., 19750 South Vermont Avenue, Suite 220, Torrance, California 90502. (213) 327-5939 TLX: 66-4256. To place your orders, call C. Itoh Digital Products. Phone toll free **1-800-423-0300.** In Massachusetts, call **1-617-769-8770.**

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Continued from page 46

payroll for both full-time and part-time employees and allows manual override. It calculates city, state and federal payroll taxes, allowing the user to maintain tax tables on the screen.

A source code license for the package is available for $2,000 to $4,000, depending on the VAX-11 model.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

NATIONAL INFORMATION SYSTEMS, INC.

VUE for IBM VM/CMS, Fortune System's Unix

National Information Systems, Inc. announced that its VUE computerized project management system is now available for the IBM VM/CMS and Fortune Systems, Inc.'s Unix operating systems.

VUE plans and manages single or multiple projects, using the critical path method of scheduling. The menu-driven system generates "what-if" scenarios, modifies information to get different persepectives on projects and responds to unexpected developments with new schedules and strategies, according to the vendor.

The Price of the IBM VM/CMS version is $23,000 for a perpetual license. On Fortune's Unix, the price is $5,000.

National Information Systems, Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

INFORMATION PROCESSING TECHNIQUES CORP.

Revision 4.01 of Exhibit

Information Processing Techniques Corp. (IPT) has announced an enhanced release of its business graphics software package for Data General Corp. and Digital Equipment Corp. computers.

According to a spokesman, Revision 4.01 of IPT's Exhibit business graphics software allows menu-driven operation or command line chart generation. The system can produce interpolated line charts, and it includes enhanced capabilities for developing multiple charts.

The firm said the package offers flexibility in chart design through a variety of type styles, colors and shade patterns. Exhibit runs on DG computers under DG's AOS and AOS/VS and on DEC's VAX-11/VMS and PDP-11/RSTS systems.

Revision 4.01 of Exhibit is priced between $3,900 and $7,500.

IPT, 1096 E. Meadow Circle, Palo Alto, Calif. 94304.

MATTERHORN, INC.

MI-Equiloc

Matterhorn, Inc. has announced the MI-Equipment Location (MI-Equiloc) for IBM 370-type mainframes under IBM's DOS or OS operating systems.

According to a spokesman, MI-Equiloc aids in the management of computer equipment by tracking the location and status of the equipment.

It provides on-line access to equipment information through IBM's CICS/VS and includes screens designed to facilitate data access.

Users can access the equipment data base by location, model number, computer device address, serial number, original vendor and maintenance vendor, according to the spokesman.

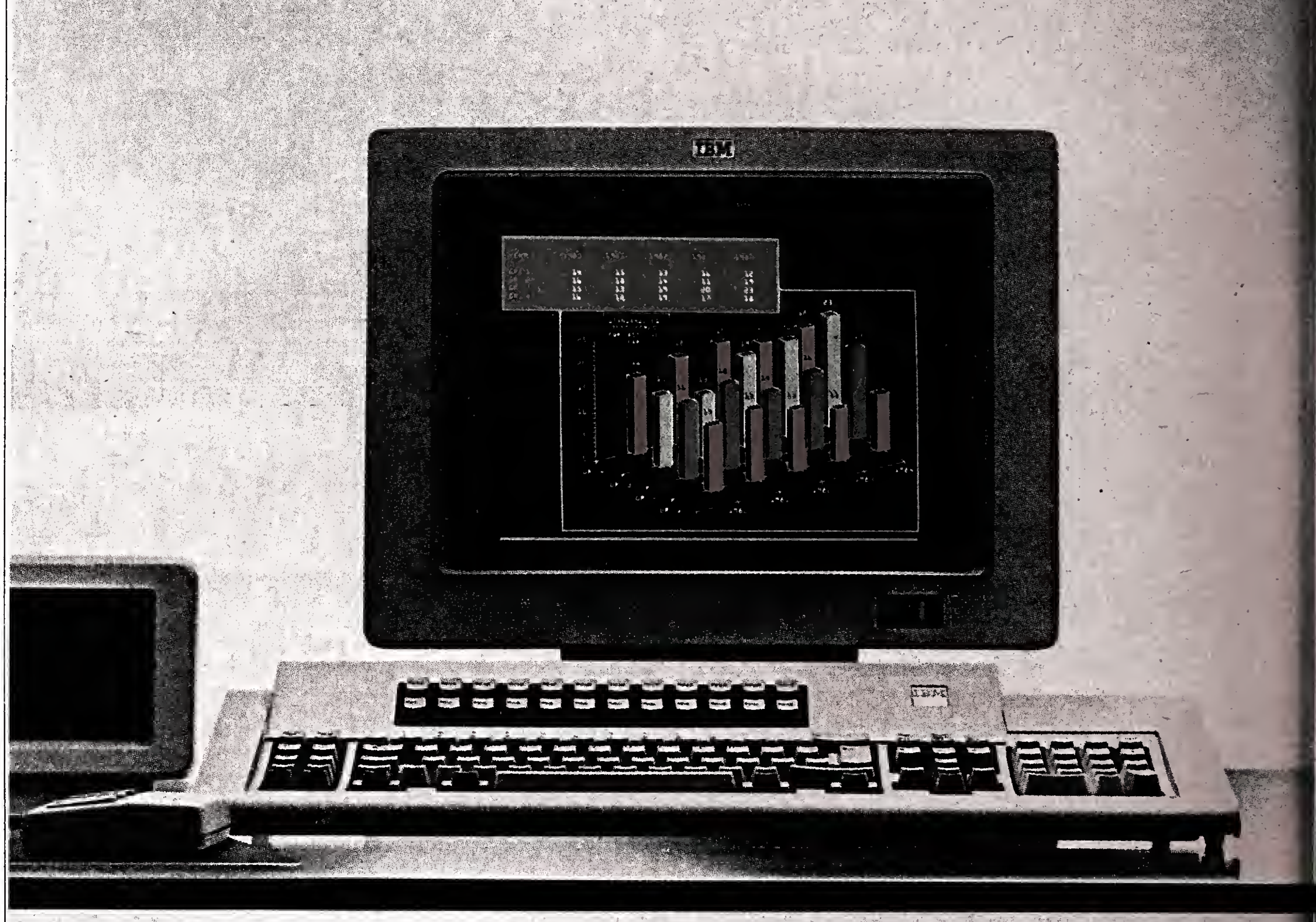
MI-Equiloc provides a series of reports that can be tailored by the user to provide details about computer equipment in a variety of formats and sequences, the spokesman said.

Users can maintain an item's repair history and data on single and multiple maintenance vendors. It can be used to track any commodity, including software, hardware and vendors in multiple locations.

MI-Equiloc is priced at $5,500 for the DOS environment and $7,500 for the OS environment.

Matterhorn, 9615 Girard Ave. S., Bloomington, Minn. 55431.

IBM introduces more



IBM 3270 PC/G

If one picture is worth a thousand words, your Smart Desk can tell you volumes.

Especially when it's equipped with a new IBM 3270 Personal Computer/G or GX.

These 3270 PCs let you create charts, graphs, 3-D technical diagrams and other high-resolution graphics right in the office. Or you can view engineering designs created on other IBM graphics systems.

The graphics are created by downloading data from your company's mainframe computer or by running stand-alone. So, in either case, the host is free to go its way while you go yours. The results: faster response time and more cost-effective performance.

The 3270 PC/G's 14-inch screen displays up to 8 colors with 76 PELs per inch; the 3270 PC/GX's 19-inch screen, up to 16 colors with 93 PELs per inch.

An optional "mouse" makes for fast, easy creation of graphics. An optional writing tablet lets your sketches appear right on the screen. There are even panning and scaling features for enlarging important details.

And, because both of these new computers are IBM 3270 PCs, you get a lot more than just pretty pictures.

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MBA from page 43

was given responsibility for several major installations of the new release of our system. And about 15 months after I began my task, people started to ask me questions. I had arrived.

I don't regret those long hours hunched over an IBM 3278. My experience left me with very definite opinions about why I succeeded and what makes a programmer think like a programmer.

There are four attributes typical of an ideal programmer:

■ Logical thought processes. The ability to understand the logical flow of a program or system and to reason through a problem.

■ Problem-solving orientation. The ability to ask good questions and leverage available resources to solve the problem.

■ Determination. Never letting go until the problem is solved.

■ Technical knowledge. Understanding the basics about the language and/or system and knowing where to go for more technical information when required.

A good programmer can become a good programmer on any system. A technical background is, of course, invaluable, but what helps the most is having the orientation and the attitude of a proficient programmer.

Some programmers never make the transition to good programmers. They can only solve problems they have seen before and cannot reason their way through a problem to reach a logical solution.

This is not to say that application generators and other productivity tools will not improve programmer output. But efficient use of such tools requires the same four qualities that a programmer writing straight code must acquire. Individuals who cannot reason through problems in procedural languages will not be any better at doing so in fourth-generation languages.

Given the task of improving programmer productivity in a systems department without a budget for software, I would try to develop these qualities in the programmers. People can be trained to approach issues in this manner. Determination is a personality trait, but it is a quality that can be encouraged and improved.

LINKS from page 43

package is the most cost-effective solution to your micro users' information needs. That is something only you can determine. And if the manufacturer asserts that the adoption of such a link will reduce end-user reliance on DP, take heed. Unless the software is exceptionally user-friendly, an attribute few packages can rightfully claim, DP will soon be awash in pleas for assistance as users struggle to make use of the new tool. If you are unable to provide that aid, the shiny new link may wind up a costly white elephant.

In reviewing the micro-mainframe links available, DP must steel itself to withstand the onslaught of all the marketing hype vendors can muster. Be prepared to demand specific explanations of the commonly used — and sorely abused — terms involved here. If a product is touted as offering real-time uploading of data, for example, find out what is meant by "real-time" and to where the data is "uploaded."

After careful review, a DP manager will likely decide that the micro-mainframe links currently available leave much to be desired. Take heart. The technology needs only time to come to fruition. Experiment to get a sense of the capabilities that are available now. And, if a product is suited to your organizational needs, adopt it on a wider basis. But do not abdicate your role as the corporate gatekeeper for new technology. Remember, fools rush in . . . .

graphics using less host.

IBM 3270 PC/GX

Each system can display up to four different host sessions concurrently, and run a wide range of IBM Personal Computer applications. You also get two electronic notepads on screen for keeping track of important information.

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- System Performance Navigator
- Change Evaluation

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The System Performance Navigator helps you to quickly identify system problems. It is a simple methodology to help you find the shortest route from the problem to the solution. You start with an overview of the service levels for a particular workload for the time period in question...be it a day, an hour, or a week...and progressively look at more detailed information based upon the data from the previous level.

Data processing needs are changing daily, requiring hardware changes, software changes, or the implementation of specific tuning methods. You need to determine the effe of today's changes and avoid yesterday's problems.

Change Evaluation helps you to understand the effects of scheduled system changes in hardware and software. EPILOG/MVS can help you understand the effects of these changes and enable you to better predict and evaluate the results of change.

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On-line data service industry growth foreseen

SAN JOSE, Calif. — The on-line data base service industry will grow at a compound annual rate of 21% for the next five years due in part to the spread of personal computers, the development of new uses for such services and growth in the availability of public data networks, according to a research firm here.

Annual revenues will reach $4.1 billion for on-line data base services in 1989, although the industry will face a variety of problems during the years in between, according to a report by Creative Strategies International, Inc., a market research and consulting firm.

The report, titled "Online Database Services," said of the still-young field, "As the industry matures, it faces new problems and challenges.

A few of the myriad areas the industry will soon have to address are: transnational data flow, the government's role as a producer and vendor in the marketplace, government control of information, system security, the education of information consumers, document delivery and copyright and end-user search interfaces."

Data base producers previously undervalued their on-line products, but have begun to charge higher royalties to cover higher costs and to reap higher profits.

Electronic mail is one service that data base operators can offer as a "natural extension" of the communications capabilities of their on-line services, while videotex services will have "a positive effect" on the market once they become more active, the report added.

According to the researchers, vendors reported that between 60% and 90% of new subscribers are using personal computers for access and that more than 10% of all new personal computers are used to access on-line data base services.

But they noted that consumer applications are not yet a primary source of revenue, although those applications will become more significant as the home computer market grows.

The study found that 1,070 producers and 327 vendors are supplying 2,225 data bases in the U.S., Canada, Europe, Japan and Australia.

The report linked growth to the availability of public data networks. "The increased availability of public data networks are a direct factor in the growth of the on-line data base services industry. Not only do these services allow users to access on-line services through their network, their wide-scale availability actually promotes awareness of these services.".

Improved software will make on-line information retrieval more attractive to consumers, particularly with the development of user-transparent systems where the user will be able to search several data bases without learning multiple protocols.

Other trends cited included decreasing hardware costs, the success of electronic publishing, the increase in the number of work-at-home telecommuters and the recognition of the benefits of direct executive data access.

The report costs $1,600.

Creative Strategies International is at 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

- ■ Bridge Communications, Inc. unveils a group of software products for use in Ethernet local-area networks/**52**
- ■ AT&T Information Systems and Sperry Corp. announce comple tion of a joint certification testing program/**52**

INSIDE

Controllers/**52**

Fiber-optic Ethernet out

YONKERS, N.Y. — Codenoll Technology Corp. recently unveiled fiber-optic transceivers for Ethernet local-area networks and a fiber-optic Ethernet starter kit.

The Codenet 3020T is a fiber-optic transceiver designed to be plug-compatible with Xerox Corp.'s Ethernet Version 1.0 hardware and software. It reportedly can be used in conjunction with Codenoll's Codebeam-20 and Codelink-2000 products and conforms to Tempest security standards.

Deliveries are scheduled for October. It costs $890 in single quantities, with quantity discounts reducing the price to as low as $410 each on orders of 10,000.

The company also announced its Codenet Ethernet Starter Kit, which is said to allow implementation of a three-node, fiber-optic Ethernet in less than 30 minutes, using screw-on optical connectors.

The kit includes three Codenet-3020/3030-FB012 fiber-optic transceivers, one Codestar-2004 four-by-four optical star coupler and three duplex 100-micron, 10-meter fiber-optic cables with connectors.

The Codenet technology is said to provide the benefit of local-area network capabilities while providing low attenuation and immunity to electromagnetic interference. According to the vendor, the product is designed for use in financial, government and military applications.

The kit costs $2,995.

Codenoll is based at 1086 N. Broadway, Yonkers, N.Y. 10701.

Micom extends Dialnet series

CHATSWORTH, Calif. — Micom Systems, Inc. recently announced three additions to its Dialnet 3000 family of full-duplex modems.

The three 1,200 bit/sec modems reportedly support asynchronous and synchronous devices and include two dual-speed autoanswer units and a dual-speed modem with directory-driven autodialer. A previously announced Dialnet 3000 modem is the Model 3024, which operates at 2,400 bit/sec.

The three new models are the 3012, 3012TA and 3012+.

The Model 3012 is said to be an autoanswer and manual-originate modem that is compatible with AT&T 212A modems at 1,200 bit/sec and with AT&T 103 modems at up to 300 bit/sec.

The Model 3012TA reportedly was designed primarily for answer-only, central computer site use as an AT&T 103-type modem at 300 bit/sec and as an AT&T 212A or Racal-Vadic 3400 modem at 1,200 bit/sec.

The 3012+, 3012 and 3012TA automatically match the transmitting speed and mode of a calling modem, the vendor said.

The 3012+, compatible with AT&T 212A and 103 modems, has an automatic-dial feature for numbers entered with a dial or selected by name from an integral 20-number directory. That directory is implemented from nonvolatile electrically erasable programmable read-only memory, according to Micom.

The 3012 costs $495; the 3012TA, $695; and the 3012+, $595.

Micom Systems is located at 20151 Nordhoff St., Chatsworth, Calif. 91311.

Commercial standard protocols still in proposal stage

DATA STREAM

John Dix

CW Senior Editor

While the recent network exhibits at the National Computer Conference showed how the use of "standard" protocols can facilitate multivendor networking, it is important to remember that the capabilities demonstrated were achieved for show purposes only.

Something of a wait

It will be some time before the vendors that participated in the demonstrations — which were sponsored by the National Bureau of Standards, General Motors Corp. and Boeing Computer Services Co. — implement the currently specified standards into commercially available products.

And it will be longer still before the manufacturers can implement the higher level protocols demonstrated because they still are not fully specified.

In fact, while the transport protocol that the participating vendors interpreted and implemented for the demonstration is mostly specified, it is still only an International Standards Organization draft proposal. This protocol corresponds with the fourth layer of the organization's Open Systems Interconnect (OSI) network reference model and is meant to ensure that data transmitted through a network arrives in the proper sequence.

The protocols used in the demonstration to enable files to be found and accessed from different types of machines — corresponding to a level seven application of the network model — are not even as fully specified as the transport protocol. The participating vendors had only a subset of the OSI file transfer protocol draft proposal to model their protocols after.

Indeed, according to some market analysts, the full network reference model will not be available in commercial products until 1987 or later.

Standardization important

This is not to disparage the efforts to standardize computer communications; the importance of such efforts is self-evident. But for planning purposes, it is crucial to understand that these standards need more work.

In the interim, users who need the control of network architectures will have to turn to vendor proprietary architectures, hopefully those that outwardly commit to future support of international standards.

Bridge offers communications tools for Ethernet

MOUNTAIN VIEW, Calif. — Bridge Communications, Inc. recently pulled the cloak off of two diskless communications servers (CS), a file server and a software package for use in Ethernet local-area networks.

The CS/1-X and CS/100-X diskless communications servers were designed to connect diverse computers via Ethernet in environments where floppy disks may be subject to contamination, or where user access to each unit is undesirable.

The CS/1-X reportedly connects up to 32 devices equipped with RS-232C interfaces, and the CS/100-X connects from four to 14 devices.

The company has also announced the NCS/100 Network Control Server, which loads operating system software, configuration files and utility programs into the diskless remote servers. It is said to support up to 40 CS/1s or CS/100s or a combination of 25 of those units. The X-series products receive their software from the NCS/100.

The NCS/100 features a 1M-byte floppy disk drive and is said to be compatible with Xerox Corp.'s Ethernet Version 1.0 and IEEE 802.3 standards at the physical and data-link layers and with Xerox Network System higher level protocols.

Bridge also announced the SPMUX software option that is designed to let the CS/1 link Sperry Corp. Uniscope display terminals to Sperry host computers via Ethernet, which it developed with Sperry.

The package is an option to Bridge's CS/1-BSC Communications Server, which provides Ethernet access to devices running character-synchronous protocols. It reportedly allows 32 terminal sessions to be multiplexed onto a single host line.

The NCS/100 costs $4,900, and the CS/1-X costs $9,600 with eight ports. The CS/100-X costs $3,600 for four ports, $4,600 for 10 ports and $5,100 for 14 ports. The SPMUX costs $1,000.

More information is available from Bridge Communications, which is located at 1345 Shorebird Way, Mountain View, Calif. 94043.

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AT&T, Sperry cap test program

MORRISTOWN, N.J. — AT&T Information Systems and Sperry Corp. have announced completion of a joint certification testing program that verified the integration of Sperry's office automation and personal computer products with the AT&T Information Systems Dimension System 85.

The certification reportedly assures that Sperry's Sperrylink desk stations, Distributed Office Processor 20, UTS30 desk stations, UTS40 desk stations and Distributed Communications Processor 10 operate with System 85.

The Sperry components were connected using RS-232C interfaces for synchronous data transmission over standard telephone twisted-pair wiring and switched through the System 85, according to AT&T Information Systems.

CONTROLLERS

DIGITAL COMMUNICATIONS ASSOCIATES, INC.
System 207

Digital Communications Associates, Inc. (DCA) has announced a network processor designed to emulate the asynchronous controller operation of the Digital Equipment Corp. DMF-32.

The System 207 network processor reportedly features character- and direct memory access (DMA)-mode output capabilities, and functions with other DCA equipment to support a cluster of remote terminals. It is intended to transfer large quantities of data with low CPU overhead using DMA techniques.

Using a DEC Unibus interface, it is said to allow host-to-host connections between computers with placement of the System 207 on the Unibus of each computer.

The System 207 consists of a single, hex-size, electronic-circuit controller board that plugs into the small peripheral controller slot of a Unibus. It supports two point-to-point trunk links, each of which can carry up to 19.2K bit/sec, and it supports up to 16 emulated DMF-32 asynchronous controllers.

Scheduled for delivery in October, it is priced starting at $4,950, the vendor said.

DCA, 303 Technology Park, Norcross, Ga. 30092.

T-BAR, INC.
T-Bar T-1 VSM

T-Bar, Inc. has announced a T1 version of its VSM matrix switch. The T-Bar T-1 VSM is control compatible with other T-Bar products, including its RS-232 digital VSM and the wideband VSM. Each has the capability to operate independently or to be managed by Overlord, T-Bar's centralized resource management system for data centers.

Delivery of the T-1 VSM will be in the third quarter of 1984, and prices range from $40,000 to $64,000, depending upon size and options.

T-Bar, 141 Danbury Road, P.O. Box T, Wilton, Conn. 06897.

Taking the right measure of system performance

By Lawrence Bernstein and Christine M. Yuhas

Good software quality control programs require that we count and measure what is relevant about system performance rather than what is convenient to count and measure. The logical result of such good quality control methods is the application of the lessons learned to the design of the next system.

In the turmoil of conversion and the initial use period, people are often seduced by easily collectible numbers and are ultimately exhausted by their efforts to fix misidentified problems.

Two common measures are often counterproductive. The first is counting total numbers and trouble reports. The second is counting outages attributable only to software. Neither stands up under close examination as a valid measure.

The folklore of trouble report counting has it that two trouble reports per 1,000 lines of source code is satisfactory, and anything less is to be honored. But consider:

How do you count source lines?

If you reuse code, how do you count it?

How do you treat trouble reports requesting enhancements?

How do you count trouble reports about design flaws?

What weight is given to the user's perception of the design organization's responsiveness?

Is the writing of trouble reports an act of futility, viable input to a remedial process or a weapon for escalating other issues?

As a rule, trouble report volume is more a measure of the number of people assigned to the testing and installation of a system than an indicator of system health. There is a proper place for this instrument, however.

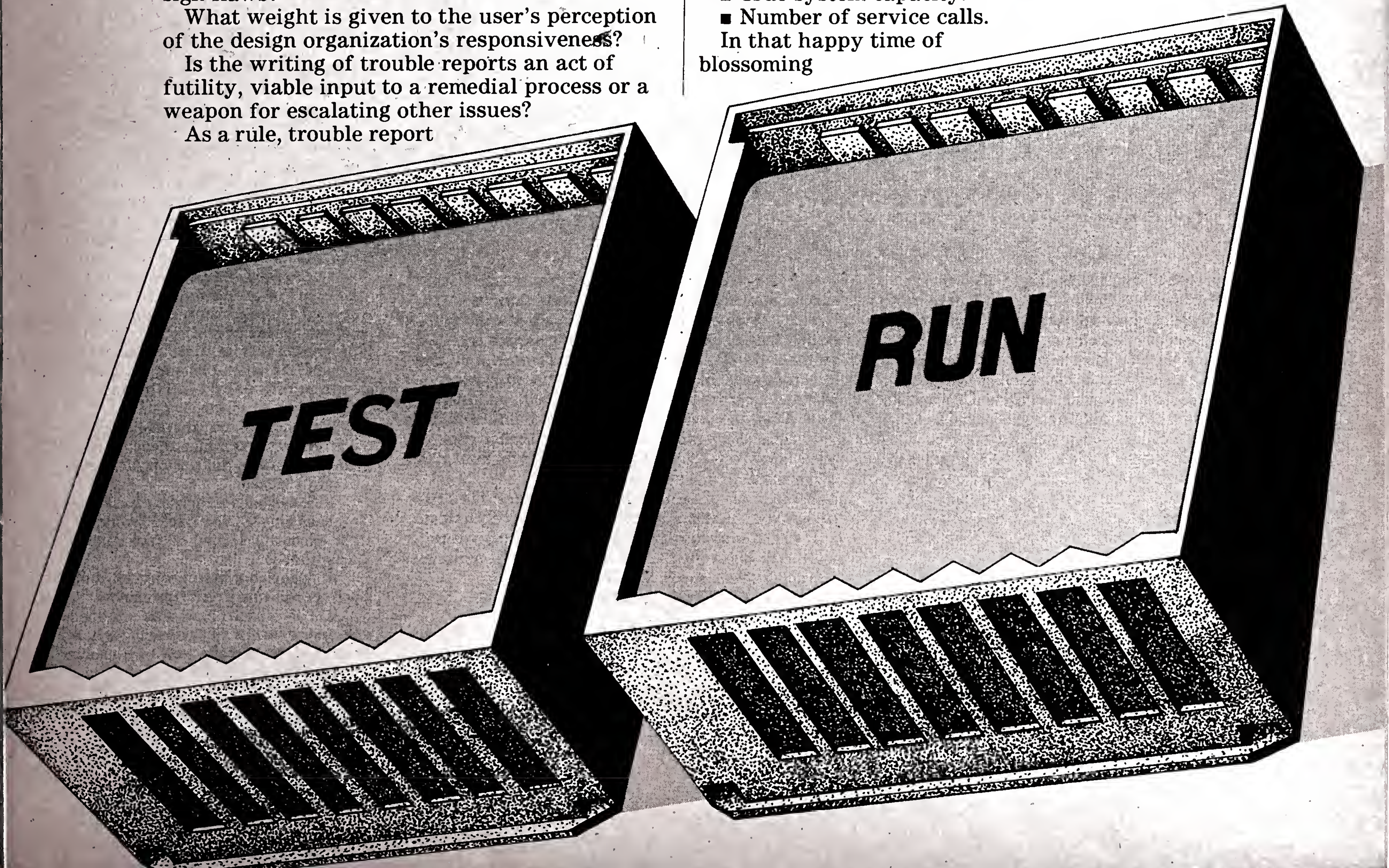
Central concern: uptime

The practice of calculating system availability by counting as outages only software downtime ignores the environment in which a system exists. It certainly places the software designer in the most flattering light; but if the objective is to satisfy the customer, all major features contributing to the user's perception of system availability must be included. The user cares about system uptime. The parts that comprise a working system — and which one has failed — are of little interest to him. A responsible software designer cannot ignore that the system is unusable simply because it is not the immediate fault of the software.

Four good measures of quality have proved useful:

- Reliability.
- Success with unexpected stimuli.
- True system capacity.
- Number of service calls.

In that happy time of blossoming



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IN DEPTH/MEASURING PERFORMANCE

> *The future will belong to software systems that realize better than 99% reliability. Good power protection and fast recovery techniques built into the software are probably the most important ingredients in achieving this goal.*

hope before the system is released to the field, the customer's attention is fixed on schedules and features. The cheerful assumption is that the system, whatever shape it finally takes, will be there working at all times.

After the customer gets the system, his focus changes to performance. When computing reliability, one should count outages from all causes: power, hardware, operations and software. The software must be designed to compensate for deficiencies in the environment so that the user obtains acceptable reliability, which today seems to be 98%.

There are serious operational problems from 95% to 98%; below 95%, the system is intolerable. The future will belong to those software systems that can realize better than 99% reliability. Good power protection and fast recovery techniques built into the software are probably the most important ingredients in achieving this goal. Software systems that rely on raw commercial power will continue to be perceived by the user as poor in quality.

To be reliable, a system must do well on the second measure of quality: dealing with unexpected stimuli. The customer will often use a system in ways that seem capricious to the software designer. If inventive and unanticipated operations can be met with aplomb, the customer has a high-quality system. In engineering terms, the system functions in a broad range around its designed operating point. A low-quality system is highly tuned to only one scenario.

The concrete measure here is a rated load test. A rated load is more than just a certain number of transactions per second; it incorporates a proportionally comparable transaction mix from the soak site and the storage requirements. Peaks and variations in traffic distribution are considered in light of 24-hour-a-day operation. A less exact but equally compelling measure of how well a system deals with the unexpected is anecdotal evidence obtained at the soak site and sampling at other sites as the system is widely deployed. One person assigned to call the soak site operations manager every day is sufficient.

Several years ago, I got a frantic call from a site manager saying my message-processing system was being brought to its knees every day by one subset of users. Each user group was allocated one thread, limited to 10 hours of processing. These rascals needed 15 hours and, though the software was operating on a multiprocessor system, the single-thread design left available computer resources idle and the site manager frustrated.

We did not have sufficient test equipment to produce these loads and, therefore, did not predict several occurrences:

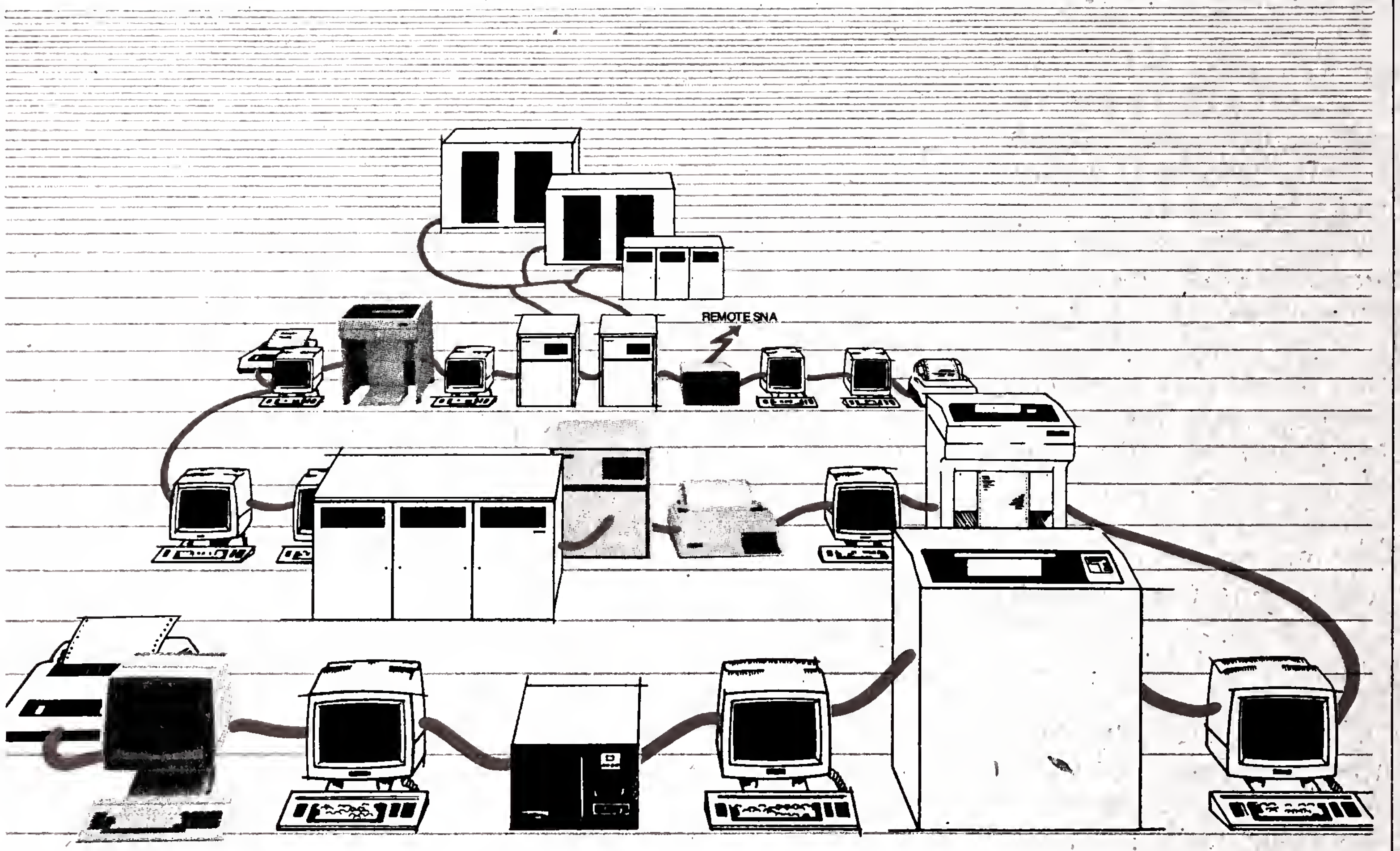
1. Sometimes allocating data base records across disk packs would incur excessive I/O when free space was limited.

2. Algorithm assumptions did not reflect the users' environments.

3. The offered load was assumed to arrive uniformly throughout the day. Unfortunately, half of it arrived during the last three hours of processing.

4. In real life, all messages are not equally important, but the computer, with fine democracy, treated each message equally in turn.

This situation, combined with the fact that the original activity



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projections established three years earlier were out of date by a factor of 1.3, resulted in a state of affairs in which customers did not get served on time while computer resources sat idle.

Obviously, a high-quality system would have had the capability of identifying and treating important messages first as the load began to build and would give some early warning when saturation was approaching while human intervention could still be beneficial.

True system capacity

The third quality measure is true system capacity, which is a combination of throughput and response time. When capacity is defined in these terms during specification writing, it can be measured during system test and again at the soak site. Periodic measurements after the system is well deployed need to be taken and analyzed; these measurements must come from all sites, not only those that are problems.

There have been situations in which the on-line system met its capacity objectives only to outrun its recovery system. Any on-line system capacity in excess of the recovery system's capacity is useless, since in the event of an outage, there are not enough hours in the day to recover the data base (see Figure 1).

The last quality measure is the number of service calls the customer makes. It is here that the trouble report can be used, but not in its raw state. Typically, during the maintenance phase, 25% of trouble reports are for new features, 40% for design flaws and 35% for actual software errors. Triage is necessary before sense can be made of any volume of trouble reports.

The most severe problems are those in which the system is down and the customer must suspend operations. This situation demands that the design organization work nonstop until a solution is found. Let us call these Severity 1 trouble reports.

Next are those problems that are critical and require expedited attention with reasonable staff overtime. These are problems that must be fixed quickly or they will soon join the Severity 1 category. These are Severity 2 trouble reports.

Since the quality of the software system should be measured not by the total of all reported problems but rather by those that cause outages or capacity problems, the number of service calls in the fourth measure of quality is the sum of the Severity 1 and 2 trouble reports (see Figure 2 on ID/4). These should be reviewed individually. Both the nature of the problem and the durability of the repair, should be examined at biweekly project meetings. As a rule of thumb, if there are more reports than can be easily covered in two hours, there is a quality problem requiring more detailed investigation.

Severity 3 trouble reports are those whose fixes will be scheduled for some future software release. Severity 4 trouble reports are those that will be fixed whenever it is convenient. These are composed of

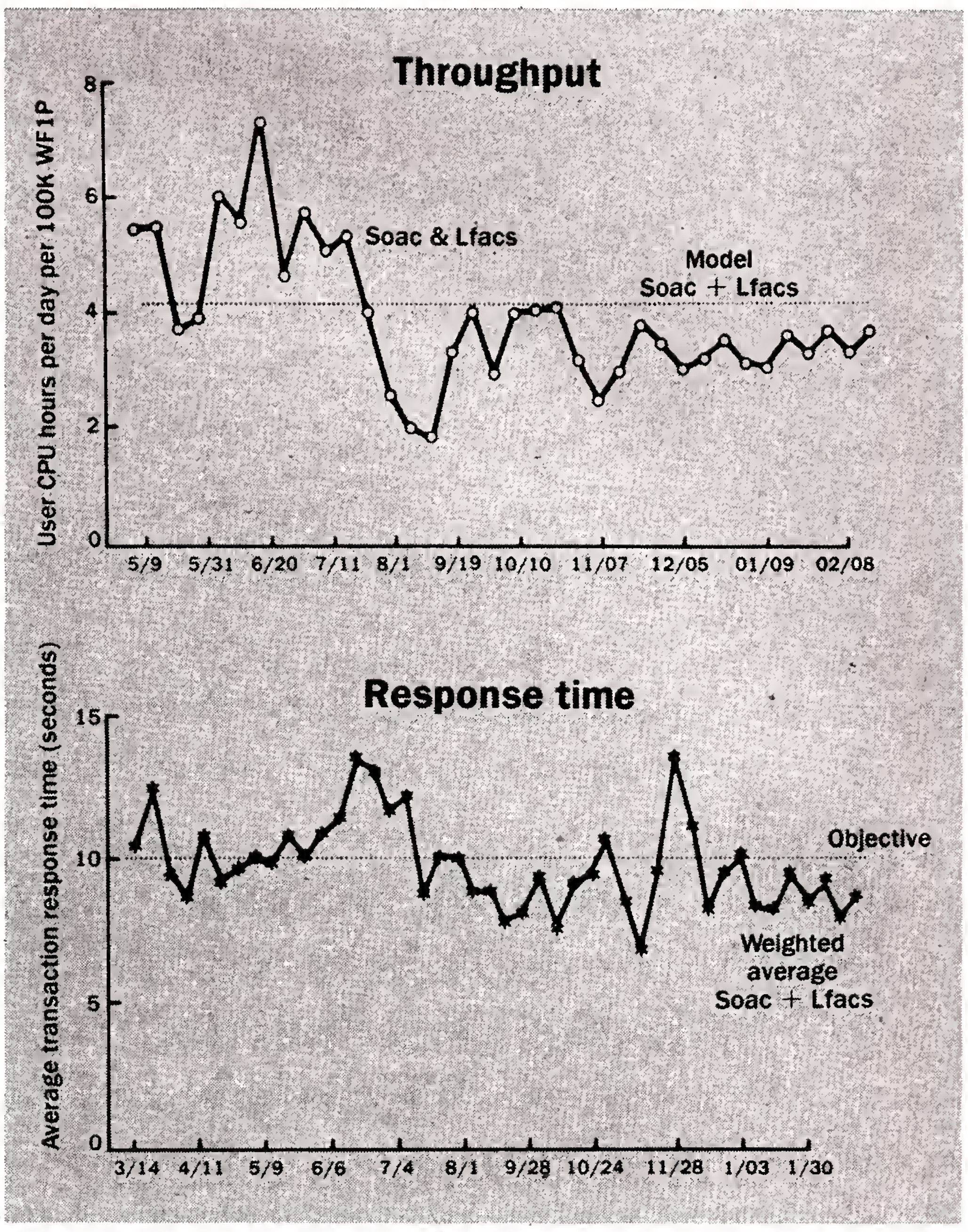

Figure 1. True system capacity.

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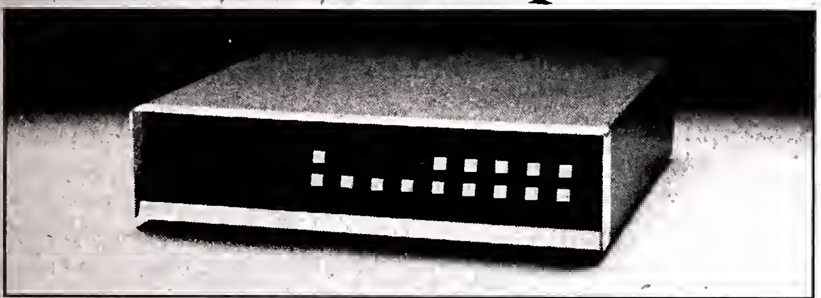

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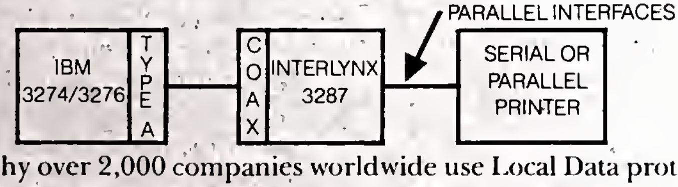

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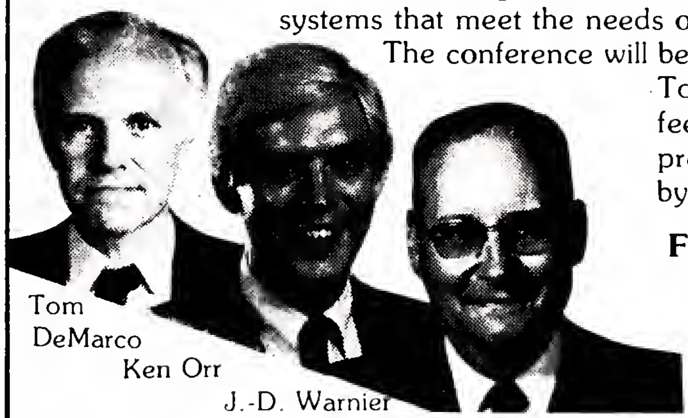

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Number of trouble reports per 1,000 lines of code

Component	(A) Release	(B)
Lfacs	.49	.68 → worse
Soac	.25	.77 → 3x worse
WM	.14	.55 → 4x worse
Cosmos	.24	.23 → same
SSE	.10	.34 → 3x worse

Number of Severity 1 and 2 trouble reports

Component	(A) Release	(B)
Lfacs	10	9 → better
Soac	5	10 → 2x worse
WM	0	1 → worse
Cosmos	2	2 → same
SSE	1	3 → 3x worse

Lfacs — Loop Facilities Assignment and Control System
Soac — Service Order Analysis and Control
WM — Work Manager
Cosmos — Computer System for Mainframe Operations
SSE — Sperry Support Environment

Note that despite some correlation between the two measures, the bottom table gives an instant picture of system-threatening trouble reports and, in Lfacs, Soac and WM, a different impression of the component's health.

Figure 2. Comparison of different trouble-report considerations.

minor enhancements, design inadequacies and new uses of the system. Also included are environment changes, as when the operating system or computer hardware is upgraded. Although this category of trouble reports is not counted in measuring system quality, careful attention must be paid to the "creeping features syndrome."

Once when we were tracking missiles, the customer demanded that we add software to alter the missile's flight path radically at certain altitudes. This kind of request is not uncommon in the flush of excitement the customer experiences when the system's usefulness is realized. Pressure builds to add "neat" features and, in the atmosphere of infectious enthusiasm, developers will rush to satisfy desires, wholesome or not.

Unfortunately, in this instance, there was insufficient time to perform a complete set of regression tests. We thought little could go wrong, since the stress functions were to be applied after the primary tracking objectives were achieved.

Murphy's Law proved out again, however. Somehow, gravity became a positive number in the predictive equations, just the reverse of nature's custom, and as soon as gravity dominated missile flight, we lost track, destroyed the missile and achieved no mission objectives. It was very embarrassing.

Severity 3 and 4 trouble reports can slow the system and emerge at some later point as service calls. This can happen when frills are added to the point of impacting performance and the code becomes such a tangle of fixes that it is not maintainable.

The point of quality control is to satisfy the customer in the real world of messy operations, strange flukes and general carelessness.

Any number of management techniques can be used to prevent this.

A system with no trouble reports is most probably a system with only *one* major trouble — the customer is so disenchanted that he is looking for another supplier. Trouble reports can be valuable in grading a system if the nature and severity, rather than the number, of problems are considered.

The point of quality control is to satisfy the customer in the real world of messy operations, strange flukes and general carelessness. Poor performance will make a system unacceptable, no matter how rich its features.

An important part of a quality control program is to take the experience in the field into the design stage of the next system and there specify reliability and capacity ratings. Only then can stress tests be developed to find out where the system breaks. The difference between the rated load and the break point is the design margin.

In light of the critical nature of software in business operations, it is reasonable to expect that we specify a large design margin for the varied environments in which software must perform brilliantly.

About the authors

Larry Bernstein is assistant vice-president with the Facilities Assignment and Control System (Facs) and Computer System for Mainframe Operations (Cosmos) Development Center of Bell Communications Research, Inc. in Piscataway, N.J. Facs and Cosmos and their supporting software modules make up an on-line processing system that automates much of the service, inventory and administration duties necessary to provide exchange telephone service.

Christine Yuhas is a former Bell Laboratories supervisor responsible for human factors engineering and system documentation.

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Keepers of the corporate data

Why specialists must compromise

The data administrator and data base administrator share responsibility for managing and controlling data. Perceived or real antagonism between the two is another result of the continuing trend toward specialization.

By Bill Durell

Should the data administrator and data base administrator be cohorts and co-workers, or do the realities of the workplace produce antagonists and competitors? What are the similarities and differences between the objectives and responsibilities of the two?

Users commonly ask:

If there is a conflict between the logical data base design (as developed by the data administrator) and the physical data base design (created by the data base administrator), who has jurisdiction?

Should the data administration staff report to data base administration, or should the data base administrators be within the data administration organization?

What is the interaction between the data administrator/data base administrator and the end user?

In most organizations, the data administrator is responsible for the global management, control and documentation of information as a corporate asset. The data base administrator is most often responsible for designing, implementing and maintaining individual data bases and data base management systems (DBMS).

These definitions allude to the basic similarities and differences between the data administrator and data base administrator. Both are responsible for the management and control of data. They are chartered to minimize the cost of data to the enterprise and to maximize the company's return on investment from its information resources. The differences between the

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Data-oriented	• Data base administration • Physical data base design	• Data administration • Logical data base design

Figure 1. Differences in data processing philosophy.

	Data administration	Data base administration
Primary responsibility	Administrative	Technical
Scope	All data bases	Data base-specific
Data design	Logical	Physical
Range of concern	Long-term data planning	Short-term development and use of data bases
Primary orientation	Metadata Data dictionary Data analysis DBMS-independent	Data Data base Data design DBMS-specific

Figure 2. Comparison of responsibilities.

two administrators are created by the different mechanisms and processes that each use to reach these objectives.

Because the responsibilities of information resource management are so comprehensive, both the data administrator and data base administrator are required to be specialists within this discipline. A specialist can produce a higher quality product (for example, a data flow diagram or program) than a generalist. Disadvantages of specialization are the resulting communication and political problems among specialized groups.

Degrees of antagonism

Throughout the history of data processing, we have experienced various degrees of antagonism between the computer operations department and the systems development department, business analysts and systems analysts and program designers and program coders. The perceived or real antagonism between the data administrator and the data base administrator is another result of the continual trend toward specialization within the data processing profession.

Because of the tremendous increase in technology over the past 20 years, DP has been forced to increase its resources for educating and training specialists. Twenty years ago, most data processing professionals were categorized as programmers. The staff of many modern application development organizations consists of programmers, programmer/analysts, systems analysts, business analysts, project leaders, systems programmers and others. However, these specialists are all primarily involved with process-oriented technology. Recently, there has been a shift from process-oriented system development to more data-oriented development techniques.

This impetus has created the need for more specialists in the data aspect of DP. These specialists include the traditional data base technician (the data base administrator) and the more contemporary specialists in data modeling, logical data base design and data dictionary technology (the data administrator).

Over the last 10 years, there has been a dramatic shift in the philosophy and procedures with which systems and programs are designed and developed. This has been caused by a shift in the costs of the hardware (computers) and the labor (data processing professionals) necessary to develop data processing systems.

Shift in systems

The cost of labor (per hour of work) is increasing. However, the cost of hardware (CPU and peripherals) in terms of units of work and capabilities (CPU cycles, cylinders of disk space) is decreasing dramatically. This has caused a shift from machine-oriented systems and programs to labor-oriented ones. In other words, data processing systems should be designed to optimize (or minimize the cost of) the labor resource and not the hardware resource.

Software packages, structured programming techniques, structured analysis and design methodologies are all intended to minimize labor costs. Likewise, the use of fourth-generation languages are increasing faster than the use of traditional languages like Cobol and Fortran.

The changes described above apply primarily to process-oriented technologies. What changes to data-oriented technologies are necessary to accommodate the shift in emphasis from hardware to labor? Traditionally, the data base administrator is concerned with minimizing the cost of the machinery or hardware involved in data management, minimizing disk space, response time and CPU cycles devoted to data accesses, updates, additions, deletions and data base reorganizations. The data base administrator also attempts to maximize the performance of the DBMS and the operating system. However, the data administrator is primarily responsible for minimizing the labor costs required to maintain data bases and to the programs that use the data bases.

The shift in costs of these data processing resources (labor and hardware) highlights the need for data administration. Although there has always existed the need for a specialist to manage the hardware costs of data management (the data base administrator), the data administrator recently has been introduced to manage the labor costs associated with data management.

This shift in the emphasis of data management is analogous to the shift in the emphasis from machine-oriented process technology to labor-oriented process technology. Figure 1 illustrates this principle.

Different levels

As stated earlier, the data administrator and the data base administrator share the responsibility for the management and control of data. However, they do so at different levels.

The data administrator is concerned with the global use of data across the entire organization; the data base administrator is concerned primarily with the local management of individual data bases and DBMS. The role of the data administrator is managerial in nature; the data base administrator's role is technical. Because data administrators are concerned with minimizing the future labor costs associated with data management and minimizing data redundancy, they are normally responsible for logical data base design.

On the other hand, the data base administrator is usually responsible for modifying this logical design where necessary to increase the performance of the DBMS and the hardware. The data administrator interacts mainly with the end user, data processing and corporate management. This interaction is necessary in order to coordinate and manage the data resource requirements of all users. The data base administrator interacts primarily with the programming and analysis technical staff, the primary users of the data bases.

Thus, the data administrator typically interacts with personnel at a higher level within the organization than the data base administrator. The data administrator is concerned with management of information about data (metadata) stored in the data dictionary; the data base administrator is responsible for managing the data itself, which is stored in data bases. These differences are illustrated in Figure 2.

Each specialist should have specific education and training to carry out these responsibilities. The data administrator needs a background in data planning, entity/relationship modeling, logical data base design, data standardization and data dictionaries.

The data base administrator's training must include data base technology, DBMS, physical data base design, data security and operating systems.

Some compromises

The overall objective of both administrators is to maximize the organization's return on investment from the information resource. From the data administrator's standpoint, this is achieved by minimizing the labor costs involved in information management. The data base administrator is primarily concerned with minimizing the machine costs involved in managing data. However, by cutting the data access time for online applications, the data base administrator also reduces the labor costs of the terminal operator.

As stated earlier, the data administrator is involved in logical data base design in order to minimize the labor costs involved in information management. During the logical data base design, the

> *A situation in which the data administrators and the data base administrators report to different managers in different organizations should be avoided at all costs. This type of situation significantly complicates the compromise issues discussed earlier.*

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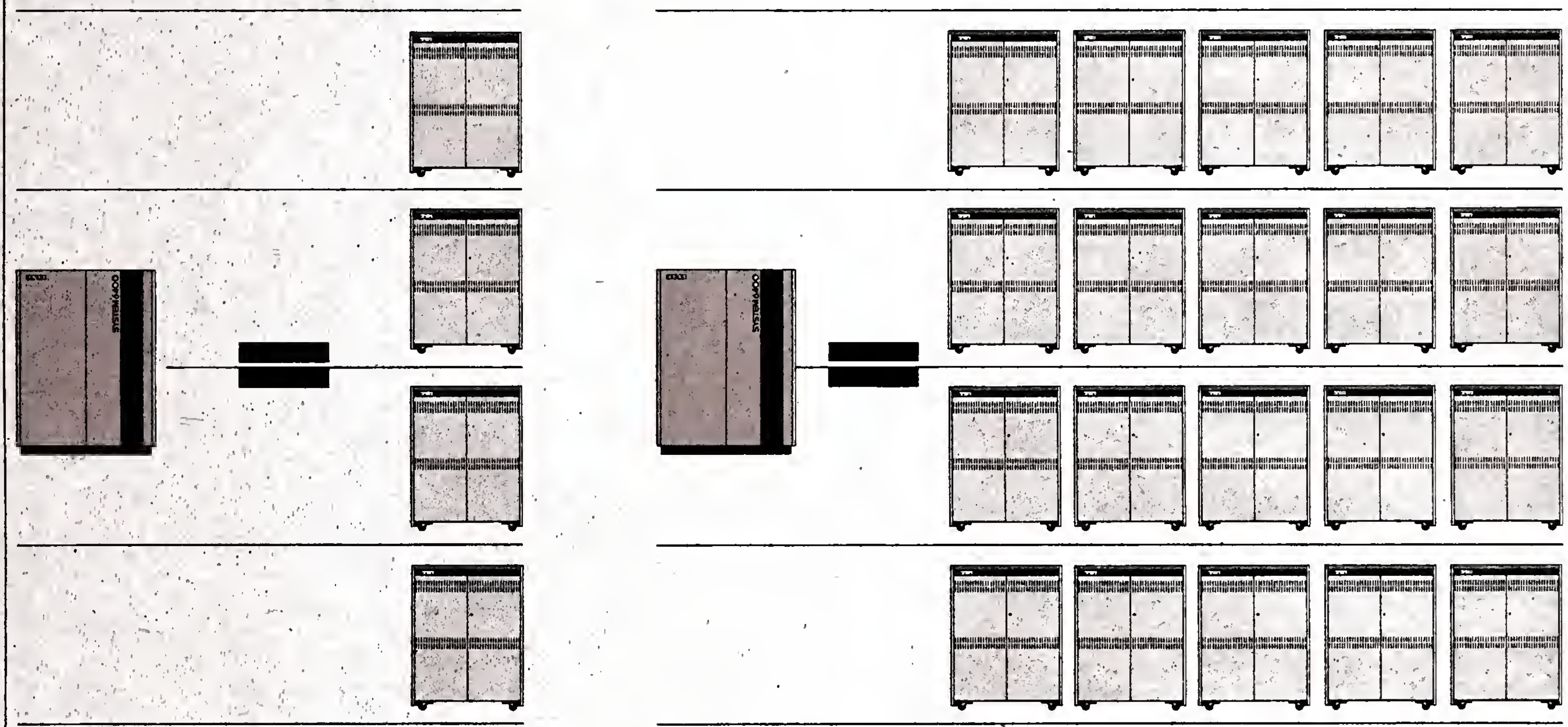

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data administrator employs the principles of normalization to achieve a data structure that optimizes modularity, extendability and utility and minimizes redundancy.

Modularity means the ability of a data structure to accommodate changes more easily to the information requirements of an organization.

That is, if changes to the structure of a data base are necessary, a modular design decreases the probability of time-consuming and expensive data base reorganizations and conversions.

Extendability means the ability of a data structure to accommodate additions or deletions to instances of data without affecting the design of the structure or the programs that use this data. Thus, an extendable data structure reduces the need to modify as a result of an increase or decrease in the volume of data.

Utility refers to the ability of a data structure to satisfy the information needs of a variety of end users. A data base with a high degree of utility permits multiple views or uses of data without the need for additional software to extract and massage data for individual end users. By minimizing redundancy, the labor costs necessary to update and maintain replicated data stored in multiple locations are reduced.

Achieving data modularity and reducing data redundancy is often detrimental to machine performance. A modular, nonredundant, normalized data structure often increases the required number of records and segments and thus increases the average number of reads necessary to locate and update an instance of data.

The result is an increase in response time and a degradation in machine performance.

Because the outcome is in direct conflict with the objectives of the data base administrator, it is often necessary for him to modify or fine-tune the logical data base design to convert it to a more efficient physical data base design. Also, the logical data base design is very relational in nature. This relational-like structure must sometimes be modified to resemble the data structure best suited for the production DBMS (for example, IBM's IMS is best suited for a hierarchical structure).

However, the modifications developed by the data base administrator should not be a radical departure from the logical design. If there is a large discrepancy between the logical data base design (by the data administrator) and the physical data base design (by the data base administrator), cost should be the determining factor in the compromise. One must ask if the benefits of modularity (reduction in labor costs) outweigh the benefits of better machine performance (reduction in hardware costs).

Figure 3 on ID/12 illustrates the need for compromises between the objective of the data administrator and the data base administrator.

Organizational factors

The ideal situation is to have a data administration group and a data base administration group at equal levels within the same organization (such as information resource management). However, this has not been the case in most enterprises. Since the data base administration organization in most companies has been in place for a considerable time, it was expedient to place the more recent data administration discipline within this existing organization. If this is the case, the data administrator and data base administrator should be at equal levels in the hierarchy. The titles of the departments are of little consequence; the important point is that the two groups within the organization have the same overall objective of information resource management.

Since the overall goals of the two administrators should be the same, it is important that both disciplines report to the same manager. This single manager and organization will reinforce the single overall objective. A single organization will also expedite any compromises necessary between the logical and physical data base design. A situation in which the data administrators and the data base administrators report to different managers in different organizations should be avoided at all costs. This situation can significantly complicate the

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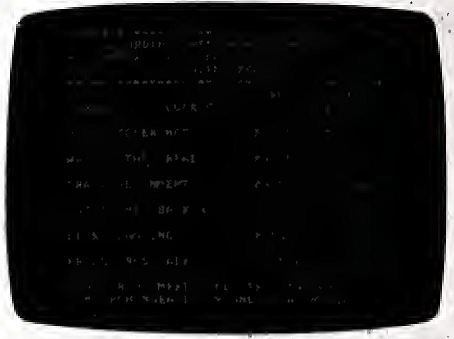

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	Data administrator	Data base administrator
Minimize	• Future data structure maintenance costs • Future program maintenance costs • Data redundancy • Data coupling	• Access time • CPU cycles • Data base reorganizations • Transmission costs
Maximize	• Data modularity • Data extendability • Data utility • Data sharing • Process/data independence	• Strengths of the DBMS • Disk space utilization • Data security

Figure 3. Objectives.

compromise issues discussed earlier.

Interaction with end user

The data administrator must obtain information related to logical data design from the end user. The data base administrator needs the information relevant to physical design.

Very early in the project, the data administrator should ask the end user the following questions concerning the logical aspects of the data design:

■ What are the user views (for example, input forms and output reports) that are needed to satisfy your information needs?

■ What are the data elements (names and definitions) contained in these user views?

■ What are the relationships among these data elements?

■ What are the rules under which data is handled in the organization?

After the logical data base has been designed and turned over to the data base administrator, the administrator must ask the end user for information pertinent to the physical data base design. The information provided by the user at this time will assist the data base administrator in modifying the logical design into a physical design. Based on the logical design, the data base administrator should research the following questions:

■ How often will it be necessary to access/update/add/delete each record type?

■ What are the average/maximum/minimum accesses per record type?

■ How much disk space will be required to store this information?

■ What is an acceptable (or tolerable) response time for this information?

■ At what times of the day/week/month/quarter/year is this information needed?

■ What are the various end users/terminals that need this information?

■ Where are these end users/terminals located?

■ Which end users will be permitted access to what data?

Data management specialists

Future advances in the technology of information resource management might require data management specialists in addition to the existing data administrator and data base administrator. Some data administration organizations now have separate titles for (data) model administrator, data dictionary technician, data librarian, change control administrator and information center specialist.

Existing data base administration organizations may someday need personnel to specialize in artificial intelligence and data base machines. Further specialization will make it even more important to strengthen the channels of communication and cooperation between the data administrator and the data base administrator.

Rigorous management of the information resources of an enterprise is a very worthwhile yet difficult goal to achieve. It must be undertaken with a united data administration/data base administration staff.

About the author

Bill Durell is president and founder of Data Administration, Inc., a Cypress, Calif., company specializing in all aspects of information resource management. Durell is the author of The Data Administrators Handbook, *to be published this fall by McGraw-Hill Book Co.*

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SYSTEMS & PERIPHERALS

Mosaic debut offers graphics workstation line

By John Desmond
CW Staff

BOSTON — Mosaic Technologies, Inc., a 15-month-old company headquartered in Billerica, Mass., last week announced its first product: a line of 32-bit graphics workstations based on National Semiconductor Corp.'s 32032 microprocessor. The workstations were designed for users in technical applications markets, including computer-aided design, computer-aided manufacturing, computer-aided engineering and computer-aided publishing.

In a press conference here, company President Arthur Campbell announced the Shared Vision Systems (SVS), which consist of eight models: four desktop units in the SVS100 series and four deskside units in the SVS200 series. All eight models were designed around the 32032 microprocessor and Mosaic's proprietary graphics processor. The proprietary graphics processor is based on the Advanced Micro Devices, Inc. 29116 bit-slice microprocessor, Campbell said.

The desktop SVS100 series offers a random-access memory (RAM) capacity of 1M to 4M bytes, while the deskside SVS200 series offers from 1M to 8M bytes of RAM, the company said. Also, the SVS100 series can accommodate two 85M-byte disk drives, while the SVS200 series can use up to four 85M-byte disk drives, the company said. Three Intel Corp. Multibus slots are available only on the 200 series.

Hardware features include the 32-bit microprocessor, 16K bytes of cache memory, a palette of 16 million colors and a 60Hz noninterlaced refresh rate on displays. The SVS products run on a licensed derivative of AT&T's Unix operating system and are said to include Ethernet and RS-232 interconnects. The SVS200 series offers Multibus interconnect as well, the company said.

Single-system prices range from $25,900 to $40,900, and volume OEM base system prices start at $18,300, the company said. The product will be available for general delivery in October, the company added. Campbell said that 70% of the company's business will be with OEMs.

The Mosaic SVS100 and SVS200 series

See **MOSAIC** page 55

- An overview of graphics printer technologies/**54**
- Datasouth Computer Corp. has unveiled a line of matrix printers for IBM System/38, 36 and 34 processors/**55**

INSIDE

Terminals/**56**
Printers/Plotters/**57**
Graphics Systems/**57**

Configurations out for Cray X-MP

MINNEAPOLIS — Cray Research, Inc. has announced three uniprocessor configurations and one four-processor configuration of its Cray X-MP supercomputer. The uniprocessor configurations offer between 1½ and 2½ times the performance of the firm's older Cray-1 supercomputer. The four-processor configuration is said to offer up to 10 times the performance of the Cray-1.

Previously, the X-MP, which is used for large-scale scientific computational applications like oil exploration and weather forecasting, was available only in dual-processor configurations. Cray announced those dual-processor models have been redesigned with newer technology circuitry that allows them to occupy half the space and consume half the power of the earlier models. The newly announced processor configurations were designed to use COS, Cray's operating system, the vendor said.

The four-processor configuration, called the X-MP/48, offers either 4 or 8 words (roughly 32M or 64M bytes) of main memory and a peak operating speed of 1G floating-point operation/sec.

The four identical CPUs operate with a 9.5 nsec clock time and have a memory bank cycle time of 38 nsec. The configuration employs the same 12-col., 270-degree arch design used in the original Cray-1.

Each of the four X-MP/48 processors can operate independently on separate jobs or may be organized in any combination to operate on a single job. The processor costs $14 million, the vendor said.

To complement the processor, Cray announced a larger model of its Solid-State Storage Device (SSD) capable of storing more than 1G byte of semiconductor memory. The SSD costs $5 million.

The uniprocessor configuration is available in three models: the X-MP/11, X-MP/12 and X-MP/14, offering 1, 2, and 4 words of central memory, respectively. The entry-level X-MP/11 costs $5 million, a spokesman said.

Cray also introduced a 1,200M-byte disk drive for use on the X-MP systems. The unit features a 10M byte/sec transfer rate and reportedly doubles the capacity and transfer rate of the firm's older DD-29 disk drive. The disk unit is available on a lease-only basis and costs $4,460/mo.

Deliveries of the newly announced products will begin by the end of 1984.

Cray is located at 208 Second Ave. S., Minneapolis, Minn. 55402.

Speakers outline advantages of multimicroprocessor systems

By John Desmond
CW Staff

LAS VEGAS — System architectures based on multiple microprocessors boost performance, are less expensive and are easier to expand than uniprocessor systems offering similar performance.

That was the consensus of four recent speakers at the National Computer Conference here who represented companies that have either announced, or are planning to announce, systems based on multiple microprocessors.

Aimed at studying the trend toward using multiple microprocessors in supermini- or mainframe-class processors, the panel consisted of representatives of four companies. Of the four companies, two firms already have multiprocessor products on the market. Two others are still preparing products for formal announcement.

Two of the firms making presentations here have targeted the fault-tolerant, or high-reliability, marketplace for their products. Both firms, Auragen Systems Corp. and Sequoia Systems, Inc., have chosen the Unix operating system for their products.

Sam Glazer, vice-president of development for Fort Lee, N.J.-based Auragen, said the multiprocessor architecture has favorable price/performance because adding microprocessors is "less expensive than adding an entire new computer."

When 32-bit microprocessors become available in larger quantities in coming months, price/performance will improve further, in Glazer's view. He added that multimicroprocessor architecture is more cost-effective for a series of small tasks and not so much for long processing tasks.

Dr. Jack Stiffler, executive vice-president and chief technical officer for Marlboro, Mass.-based Sequoia, said his company's goals were to develop an expandable transaction processing system that incorporated fault-tolerant features and supported standard interfaces. While the firm is not expected to announce its product

See **CPU** page 58

Wordplex unveils modular office system

By Kathleen Sullivan
CW West Coast Bureau

WESTLAKE VILLAGE, Calif. — Wordplex Corp. has announced the Wordplex 8000 Integrated Office System, a modularly designed office automation system that incorporates multiprocessor technology for multiple job processing.

At the center of the Wordplex 8000 is a 16-bit central control unit, a printed-circuit board containing one Zilog, Inc. Z80001A microprocessor. The control unit serves as a central bulletin board, directing traffic from one part of the system to another through an internal data bus, the vendor said.

In addition to the Z80001A microprocessor, the system includes 8-bit Z80 microprocessors that act as workstation managers. The number of microprocessors in the system corresponds to the number of workstations supported. For example, an eight-system configuration includes eight Z80 chips.

The Wordplex 8000 uses the Gemini operating system, a proprietary operating system that allows each workstation to run two applications simultaneously in the foreground, while printing runs in the background.

The company refers to this feature as a dual foreground system, which allows two tasks to run concurrently and gives users the ability to switch back and forth between two applications. For example, a user can continue to work on a work processing document at the same time a list and sort program is running. With one keystroke, the user can switch to the list and sort application, the vendor said.

The system supports up to 24 central or remote workstations and 24 printers, the company said. It provides access to the system's central mass storage capabilities, word and data processing, electronic filing and communications. In addition, it provides access to internal and external resources, including links to mainframe computers and data base facilities (via compatible IBM Systems Network Architecture, Binary Synchronous Communica-

See **WORDPLEX** page 55

Printers keep pace with image processing technology

By John Rumsey
Special to CW‡

> *As image processing advances, two important issues must be considered: the developments made in electronic components in the image processing unit of the printer and the nonimpact printing technology itself.*

Management charts, multidimensional graphs and sophisticated reports, now essential to many daily corporate operations, will become more complex as both image processing and image generation mechanisms advance technologically.

In terms of printing and associated output technology, graphics developments are occurring in the areas of software and electronic components and in the printing engine itself.

Image processing has evolved from type fonts and character and line space manipulation to character cell, symbol-oriented graphics such as logo and report-format generation and bit-oriented graphics. As image generation has advanced, so has printer technology for overlaying and merging these images.

The result has been the ability to generate report forms and text simultaneously as well as to produce traditional graphs and charts. Printer technology is building on this capability and soon will be able to overlay simultaneously a variety of images — text, report forms, logos and bit-mapped images — which will approach photographic quality in a data processing environment.

The evolution to cell- and bit-oriented graphics has provided a much greater degree of control and flexibility than afforded by previous image processing technology. Image processing, associated with line printing, typically has offered only font and line manipulation with some simple, fixed-symbol generation.

Unlike line printer graphics, which defines a limited set of fixed symbols and communicates these to the host by embedding them in a data stream for simple output, nonimpact, cell-oriented printing separates text and graphics in a more sophisticated method to communicate images to the printer.

With cell-oriented graphics — typically associated with high-speed, nonimpact printers — software exists at either the host level or the printer level, creating a unique cell set for the respective image. This software then allows the user to define an image via an English-oriented definition language, resulting in a highly compressed graphics data set.

Once defined, these images are placed in a file and downloaded to the printer's configurable image generator. Variable data, typically the text of a report, is also downloaded to the image generator. Once suitable images and variable data are accumulated and buffered, they are merged and sent via a bus or other communications device and are printed simultaneously, eliminating the need to print text on preprinted report formats.

Bit-oriented graphics, on the other hand, increases the sophistication of the graphics output with control over each dot printed. Images defined by software or via a scanner device are compressed and downloaded to the printer memory. Once buffered in the printer memory, the entire image is reconstructed before being printed. Memory requirements are a function of the attendant compression/decompression algorithms required to accommodate the 57,000 bits of information creating each square inch of an image at a dot density of 240 per inch.

As image processing advances, two important issues must be considered: the developments made in electronic components in the image processing unit of the printer and the nonimpact printing technology itself. As mentioned, the ability to merge and overlay a variety of images is a function of the architecture of the electronic components of the printer, accommodating a variety of images with the same image generator and merging various image types to create a very complex graphics output.

Nonimpact printing is extremely important in bringing this technology to the user in the most cost-effective and reliable method possible. Cost, speed, copies between failures, toner transfer efficiency and mechanical complexity are important considerations in ensuring consistent output of the images created by current and future image processing technology.

Currently, laser and ion printing are the most popular nonimpact printing methods.

Ion printing operates by means of an ion-projection cartridge that lays an image directly on a dielectric drum by projecting an array of charged particles. This cartridge and an imaging process, which includes a toning system to develop the image and a pressure roller to transfer the image to the page, contrasts with the mechanisms used in laser printing technology. The mechanisms associated with laser printing include the laser, modulator, mirror assembly, charge corona, transfer corona and photoconductor.

The laser process consists of six steps that involve a corona to charge the photoconductor surface. This charging process then exposes the surface of the photoconductor by either electrically or mechanically modulating a laser. The image is developed by a dual-component toning system and subsequently transferred to paper with a transfer corona. Finally, the image is fixed to the paper in a separate fusing station.

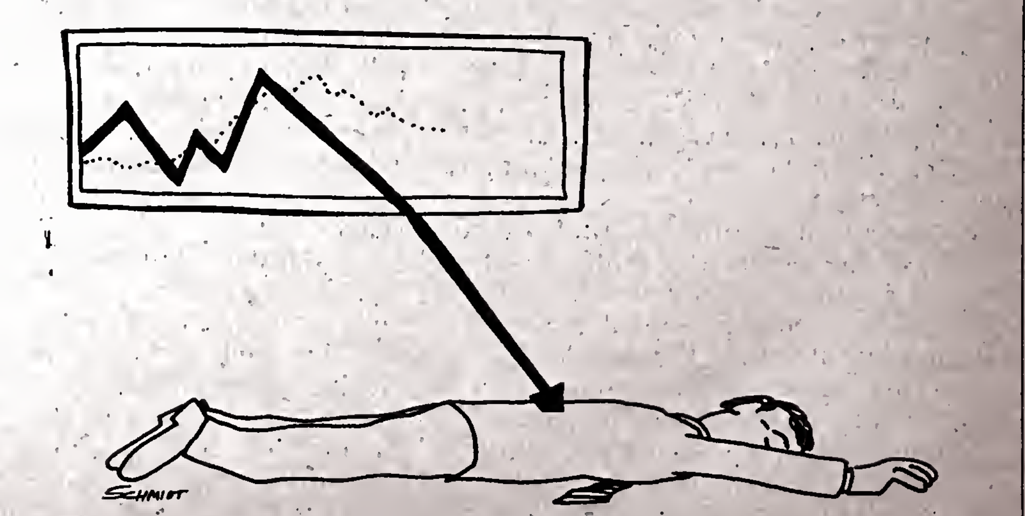
Complex mechnical equipment and sophisticated feedback systems are needed to maintain quality on laser printer photoconductors because the photoconductor coating wears quickly and scratches easily. Because ion deposition provides a solid-state imaging system without light, the photoconductor can be replaced by a coated dielectric drum able to operate in a less controlled environment.

The ion printing toner can be aggressively transferred with little drum cleaning and without damage. This aggressive transfer results in a toner transfer ratio wherein 99.8% of the toner is transferred to the paper. This transfer rate, as compared with a rate of less than 80% in a laser system, is especially important as high-volume, complex images are generated.

In the case of ion printing, characters are formed when charged particles are attracted in a dot matrix pattern to the surface of the rotating drum. After this process occurs, a single-component magnetic toner is used. This single-component toner does not suffer from low transfer efficiency because the ion printing mechanism uses direct pressure on a heated dielectric surface, and the high transfer efficiency results in a much cleaner machine.

The ion printing system can operate at up to 10,000 lines per minute with a reliability of more than 500,000 copies between failures. In addition, the toner and transfixing process produces more than one million copies before maintenance, and the transfixing process is guaranteed at one million copies.

Rumsey is vice-president of research and development at Delphax Systems, Inc., a Mississauga, Ont., manufacturer of ion deposition printers.



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MOSAIC from page 53

are said to share an architecture based on Mosaic's 32-bit System Memory Interconnect, intended to integrate Mosaic's CPU, graphics processor, memory/video and peripheral controllers. The company said this integration eliminates internal communications bottlenecks experienced in systems that include graphics as part of an I/O subsystem.

Complementing the 32032 microprocessor are the National Semiconductor 32082 demand-paged memory management unit and the 32081 floating-point processor. Mosaic's architecture is said to feature separate read and write buses, with a sustained 48M byte/sec bandwidth. The workstations are capable of performing at approximately 1 million instructions per second, the company said.

Software for the Mosaic products is based on the Mosaix operating system, the company's version of Unix Version 4.1 said to include elements of Unix Release 4.2 and System V. The adaptations are said to optimize virtual memory performance, enhance the system response time for interactive graphics and support the users group interface.

The company's Graphics Image Management system is said to simplify the work of applications programmers by maintaining all the associations and linkages between the components of a displayed image. Another feature is the Mosaic Window Manager, said to allow simultaneous display of independent applications. Mosaic's systems support C, Fortran 77, Pascal, CCA Uniworks, Inc.'s CCA-Emacs editor and Network Research Corp.'s Fusion network software.

Campbell said Apollo Computer, Inc., Sun Microsystems, Inc. and Masscomp are Mosaic's major competitors. IBM, Digital Equipment Corp., Prime Computer, Inc. and Data General Corp. offer superminicomputers with graphics terminals as one component of a distributed information processing environment, which Campbell said compromises graphics performance. He compared the performance of the Mosaic workstations to DEC's VAX 11/780.

The price for the lowest cost system — SVS110 with 32-bit CPU with 1M byte of memory, a 64-bit proprietary graphics processor, 85M-byte Winchester disk drive, 45M-byte streaming tape, 15-in. monitor with 1,024- by 800-pixel resolution — is $25,900, Campbell said.

The price for the highest cost system — the SVS252 color workstation with 32-bit CPU, 2M bytes of memory, same disk drive and backup and a 19-in. landscape orientation 512- by 640-pixel resolution monitor — is $40,900, Campbell said.

For more information, Mosaic Technologies is located at 47 Manning Road, Billerica, Mass. 01821.

WORDPLEX from page 53

tions or asynchronous protocols) laser printing, telex and Viewdata.

The Wordplex 8000 offers password security control for data files as well as software programs, the firm said. Secondary levels of password security allow limited user access on a read/write or read-only basis.

At present, the system offers up to 900M bytes of on-line hard disk storage, with both fixed or removable storage media available as options. Removable storage data packs range in capacity from 80M to 300M bytes.

The system includes built-in expansion slots, which can be used to add extra processors with their own memory.

The price of the Wordplex 8000 depends on the configuration, a company spokesman said. A system with eight workstations, three letter-quality printers and 80M bytes of removable storage would cost about $10,000 per workstation, he said. A 24-workstation configuration that included 12 printers and 160M bytes of storage would cost about $7,500 per workstation.

Wordplex is located at 141 Triunfo Canyon Road, Westlake Village, Calif. 91359.

Datasouth offers TX5180 printer for use with System/34, 36, 38

CHARLOTTE, N.C. — Datasouth Computer Corp. has announced the TX5180 medium-speed dot matrix printer for use with IBM System/34, System/36 and System/38 minicomputers via a twin-axial cable, said to be a plug-compatible replacement for the IBM 5256, 5224 and 5225 printers.

The TX5180 features a Centronics Data Computer Corp.-compatible parallel interface for use as a shared printer between a twin-axial compatible host and an Ascii system such as the IBM Personal Computer, the company said.

Operating at 180 char./sec, the TX5180 is said to print from 75 to 400 line/min. Horizontal pitches include 10, 12 or 16½ char./in. and expanded print for highlighting text, the company said.

Forms from 3- to 15-in. wide can be used, as well as multipart forms up to six copies. The 9-wire printhead is life-tested at more than 500 million characters, and cartridge ribbons are rated for 4 million characters, the company said.

The TX5180 is priced at $2,995, the company said.

Datasouth Computer is located at 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

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Suggested retail price for dBASE II is $700.
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TERMINALS

MCDATA CORP.
MC74 Models 41C, 61C

McData Corp. announced two control unit models that join the MC74 family of IBM 3274-compatible control units. The Models 41C and 61C connect remotely to IBM and compatible networks operating in either IBM Systems Network Architecture/Synchronous Data Link Control mode or Binary Synchronous Communications mode.

The Model 41C is a 32-port remote control unit that operates in place of IBM 3274 Models 1C, 21C, 31C and 41C and is one-half the size of the corresponding IBM models. List price is $14,542.

Model 61C is a briefcase-size 16-port unit that operates in place of IBM 3274 Models 51C and 61C, priced at $7,286.

McData, Twin Lakes Technological Park, 4665 Nautilus Court S., Boulder, Colo. 80301.

TELEVIDEO SYSTEMS, INC.
922

Televideo Systems, Inc. has announced the Model 922 Ansi 3.64-compliant CRT terminal said to be able to replace Digital Equipment Corp.'s VT220 and VT100 CRT terminals.

The 922 features an alphanumeric keyboard said to combine the VT220 and VT100 keyboards, a tilt-and-swivel screen and a 10-key calculator-style keypad for accounting applications.

The 922 is priced at $995 and will be available in August, the vendor said.

Televideo Systems, 1170 Morse Ave., Sunnyvale, Calif. 94086.

TELECOMET, INC.
Sigma-Data 3200

Telecomet, Inc. has announced the Sigma-Data 3200 workstation, said to function as a word processor, teletypewriter and computer terminal for text, data and communications.

The 3200 uses an Intel Corp. 8086-2 16-bit microprocessor and features automatic dialing and redialing and time transmission for teletypewriter and direct-distance dialing. Text input features include vertical scrolling up to 999 lines and horizontal up to 156 columns.

Among file/recall features are alphabetical organization, global search capability and text review by scrolling on lower screen without disturbing text entry on upper display, the company said.

Other features include 256K-byte memory, 1.3M bytes of disk storage, concurrent multiport capability to communications protocols, all functions on dual disk.

The 3200 is priced at $6,900.

Telecomet, 820 Second Ave., N.Y., N.Y. 10017.

VIA SYSTEMS, INC.
Worksystem

Via Systems, Inc. introduced a modular combination of hardware and software tools for the integrated circuits industry. Via's Worksystem interfaces with the Unix operating system and the Ethernet local-area network.

Modules for Worksystem include Worknode 50, a diskless graphics and processing node that uses Worksystem network capabilities to access Via's Toolkits software, other nodes or other systems. Worknode 50 prices begin at $24,900, and it will be available in the fall of 1984.

Systemnode 100 is an interactive graphics layout and specialty processing node with local data storage. Prices start at $103,500, and immediate delivery is available.

Systemnode 150 is similar to the Systemnode 100, but more powerful. Pricing begins at $159,500, available immediately.

Systemnode 200 is a graphics and processing node with local data storage for use as a stand-alone or networked Worksystem. Prices begin at $59,900, and the system will be available in the fall of 1984.

The Systemnode 250 is an expanded processing node that supplies enhanced computing power and data storage for other nodes linked by the Worksystem network. Prices start at $89,900, and the system will be available in the fall.

Software Toolkits are available in the areas of design capture, design engineering, physical design, physical engineering and circuit fabrication.

Via Systems, 76 Treble Cove Road, N. Billerica, Mass. 01862.

MEGADATA CORP.
VIX Models I and II

Megadata Corp. announced two VIX intelligent workstations based on the Motorola Corp. 68000 microprocessor. The systems are said to be compatible with the firm's intelligent or dumb terminals and support a version of AT&T's Unix operating system.

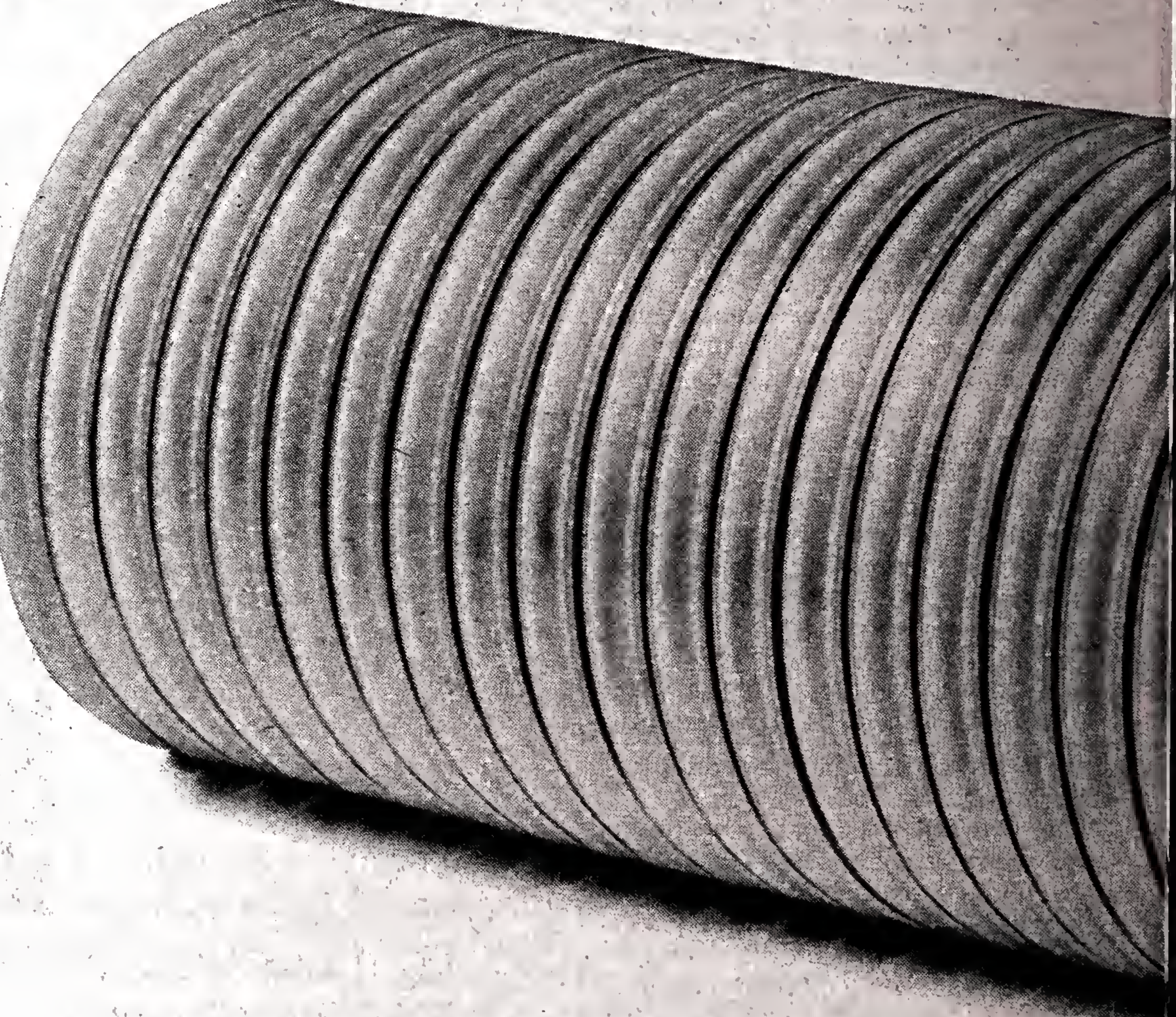
Both VIX variations offer a nine-slot multibus card cage, optionally upgradable to 16 slots. Languages supported on the models include C, Cobol-74, Fortran 77, Pascal, Basic Plus, SMC Basic, macro assembler and simple assembler. Both models feature Unisoft Corp.'s Uniplus operating system.

Model I has two 5¼-in. dual-sided, dual-density disk drives with a 1.4M-byte capacity combined with a 5¼-in., 20M-byte Winchester disk drive, the vendor said.

The larger Model II includes a 640M-byte disk storage capacity and a 20M-byte streaming tape drive. Prices range from $10,000 to $23,000 per system in low-volume quantities.

Megadata, 35 Orville Drive, Bohemia, N.Y. 11716.

For fast relie



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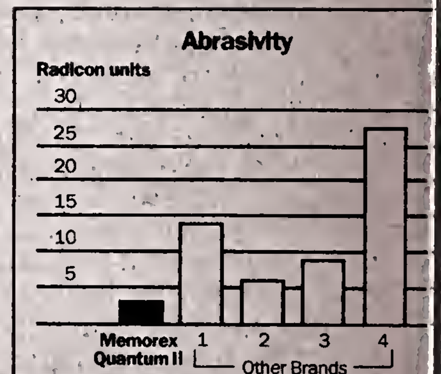

Radicon Test measurements above are obtained by running different computer tapes over an irradiated tape drive head. The higher the count of irradiated particles rubbed onto the tape, the more abrasive the tape.

SYSTEMS & PERIPHERALS

ESPRIT SYSTEMS, INC.
ESP 6110

Esprit Systems, Inc., has announced the ESP 6110 video display terminal. The ESP 6110 reportedly was designed for compatibility with the Lear Siegler, Inc. ADM 3A terminals. The emulation modes reportedly can be set via a menu-driven selection process.

Other features include a tilt-and-swivel display and a 14-in. video screen with a 9- by 11-dot character matrix.

The ESP 6110 costs $495.

Esprit Systems, 100 Marcus Drive, Melville, N.Y. 11747.

TEKTRONIX, INC.
4106

Tektronix, Inc. has announced a display terminal said to be an extension to its 4100 series of graphics terminals. The 4106 is compatible with Digital Equipment Corp.'s VT100 terminal and supports the Tektronix 4957 graphics tablet.

The 4106 supports the Ansi X3.64 standard for text editing to provide compatibility with screen editors that use Ansi X3.64 commands. It has a 9½- by 7-in. viewing area and a coordinate space of 4,096 by 4,096 addressable points. The terminal has an Intel Corp. 80186 CPU, a standard RS-232C interface, two additional RS-232C ports for peripheral support and a parallel port for connection to the Tektronix 4695 color graphics copier.

The 4106 computer display terminal is priced at $6,595.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

FALCO DATA PRODUCTS, INC.
Fame II enhancement

Falco Data Products, Inc. has announced that a second page of memory has been added as a standard feature on the Fame II terminal in the Televideo Systems, Inc. 925 mode. The extra page provides another 2K bytes of memory, with 80-col. by 24-line display, the company said.

The Fame II also features a 14-in. screen, ability to handle 24 lines by 80- or 132 columns with the Digital Equipment Corp. VT100 and VT52 and 50 user-programmable function keys with 900 bytes of storage, the company said.

The Fame II based on the Ansi X3.64 standard is priced at $795.

Falco Data Products, 1286 Lawrence Station Road, Sunnyvale, Calif. 94089.

PRINTERS/PLOTTERS

AMPAK BUSINESS SYSTEMS, INC.
Laserjet; LQ 1500

Ampak Business Systems, Inc. has modified Hewlett-Packard Co.'s Laserjet laser printer and Epson America, Inc.'s LQ 1500 dot matrix printers to operate on IBM's System/34, 36 and 38 systems as well as IBM's Personal Computer. The compatibility was made possible by using controllers developed by the vendor.

The HP Laserjet is said to offer the HP laser built around the Canon U.S.A., Inc. LBP-CX laser print engine. The Laserjet is said to print up to 8 page/min, with 300- by 300 dot/in. resolution. The printer comes with the Courier 10 font and is said to offer up to four resident fonts with plug-in cartridges.

The Epson America, Inc. LQ 1500 has also been made compatible with the IBM CPUs via an ABS controller. The LQ 1500 is said to print at a speed of 200 char./sec in draft mode and 67 char./sec in letter-quality mode. The LQ 1500 is also said to offer a variety of character styles and sizes, including enlarged, condensed, elite, elite condensed, elite enlarged and proportional.

The LQ 1500 has a single- and dual-bin sheet feeder and can be shared with an IBM Personal Computer with the company's connection option. The LQ 1500 is priced at $3,495, the company said.

Ampak, 2640 Walnut, Tustin, Calif. 92680.

NUMONICS CORP.
Model 6412

Numonics Corp. has introduced a flat-bed, automatic pen-selecting plotter that connects to RS-232C and IEEE standard interfaces. The Model 6412 has 10 pens and can produce graphs, bar and pie charts and diagrams on paper, drafting paper or transparency film, according to the vendor.

The pens are chosen and recapped automatically, and colored pencils may also be used, a spokesman said.

Price of the Model 6412 plotter is $2,795.

Numonics , 734 Pine St., Philadelphia, Pa. 19106.

GRAPHICS SYSTEMS

CALCOMP, INC.
Vistagraphic 4500

Calcomp, Inc. introduced a raster graphics terminal specifically for military, government and OEM applications.

The Vistagraphic 4500 was designed for simulation and training, tactical command and control, data analysis in government applications, computer-aided design, engineering and mapping for OEM applications.

The Vistagraphic 4500 is compatible with Calcomp Graphic 7, Graphic 8 and other Vistagraphic 4000 series display systems through its standard software.

The complete Vistagraphic 4500 terminal is priced at $22,575, with a dual-independent screen version priced at an additional $7,725.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801.

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SYSTEMS & PERIPHERALS

Multimicroprocessor architecture seen best suited for scientific uses

By John Desmond
CW Staff

LAS VEGAS — What is the advantage of using a series of low-power microprocessors over traditionally more powerful large-scale processors? Panelists at a recent session at the National Computer Conference here agreed that a multimicroprocessor system architecture may not suit every application.

Dr. Jack Stiffler, executive vice-president and chief technical officer for Sequoia Systems, Inc., said that for complex scientific applications, the mainframe architecture may still be the best approach. But in a distributed processing environment, for example, Stiffler said the multimicroprocessor approach can be less costly and more efficient.

Other panelists at the recent session disagreed with session leader Omri Serlin, president of Itom International Co. in Los Altos, Calif., who suggested that microprocessors are low-power devices. Larry Wade, vice-president of marketing for Sequent Computer, said the microprocessors within the multiarchitecture should be considered high-powered and not low-powered.

Serlin asked why each of the companies represented on the panel chose to modify the Unix operating systems rather than "start from scratch."

Wade said, "We don't need another instruction set or operating system," and a new operating system would take too long to develop.

Sam Glazer, vice-president of development for Auragen Systems Corp., agreed, saying, "We need a standard where everybody's program will run on everybody else's computer. Unix makes our life a lot easier."

Steve Blank, vice-president of Convergent Technologies, Inc., said that when he had the same debate about operating systems within his own company, some had the feeling that, "Real men build their own instruction sets; they don't use off-the-shelf instructions." Outside of the emotional issue, Blank said the time it would take to market an original system was a concern.

An audience member asked why the panelists referred to the Unix "standard" when each of them made substantial revisions to the operating system. The answers broke down by market, with the technically oriented vendors saying they chose to revise Unix 4.2 and the commercially oriented vendors saying they chose Unix System V.

Stiffler added that his company is targeting both end users and OEMs, so his system supports both Unix versions.

CPU

from page 53

formally until this fall, Stiffler said he feels those corporate goals have been met.

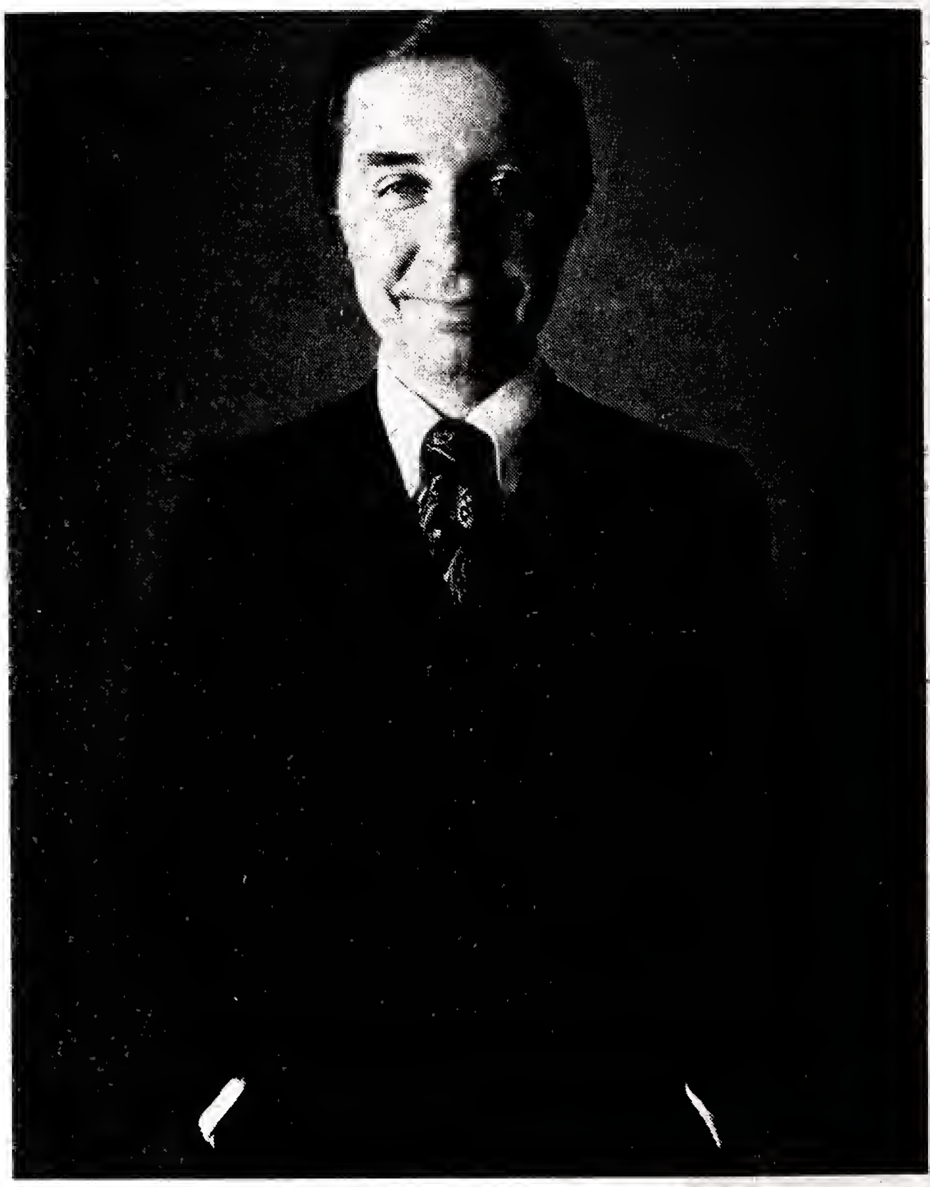
Two of the panelists represent firms that have chosen the multimicroprocessor architecture for commercial processing systems.

Steve Blank, vice-president of Convergent Technologies, Inc. of Santa Clara, Calif., said the company has shipped over 2,000 multiprocessor products (or about 10,000 CPUs) in one year.

Larry Wade, vice-president of marketing for Sequent Computer in Portland, Ore., who formerly worked for Intel Corp., said his firm is concentrating its yet-to-be-announced product on the technical OEM market. The system will not be fault tolerant, but will be "optimized for the technical marketplace," Wade said.

He echoed comments from Glazer that the multiprocessing architecture has a future because "end users need to expand without losing their investment."

Bob Whatsisname in Accounting. He's into computers. Yours.



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MICROCOMPUTERS

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DP chiefs see rising influence in micro purchasing decisions

By Edward Warner
CW Staff

CANOGA PARK, Calif. — Large companies are seeing increased demand for micro-mainframe links and data base management software, along with a far greater reliance on the data processing department in microcomputer buying, according to a recent telephone survey of data processing executives and chief financial officers at 122 Fortune 500-type firms.

The survey, done by a Chicago market research firm for Informatics General Corp., also found that 70% of all respondents said that the IBM Personal Computer either was or will be playing a "predominant role" in their microcomputer strategy.

Also notable, according to Informatics General Product Marketing Manager R. James Dickie, is the survey's finding that top management executives — whether in data processing or end-user groups — were far less likely to use microcomputers than were financial analysts, programmers, clerical workers and departmental managers, in that order.

The survey's big news for data processing executives may be its reflection of the increased power they now hold in microcomputer acquisitions. The survey found that 39% of respondents said the hardware purchase decision was "largely dictated by DP personnel." A slightly greater number, 41%, said that data processing had the power to recommend, with the final purchase decision residing with the end user.

The same survey last year showed that only 10% of total respondents felt that DP had the hardware buying power, and about 15% felt it had the power to recommend, Dickie noted.

In addition, 71% of respondents identified the data processing department as the source of their firm's personal computer integration strategy. Only 22% of respondents ascribed that power to the end user.

The buying decision, however, was found by the survey to be made most often in the corporate head offices and not at the user's site. In addition, the survey noted that 14% of respondents worked for firms with a "company policy to purchase only IBM" equipment.

The survey showed application preferences lined up along fairly predictable lines, Dickie observed. The package which led the pack — rated "very important" by

See **CHIEFS** page 70

Software tests bring surprises

By Paul Korzeniowski
CW Staff

WYNNEWOOD, Pa. — With the glut of microcomputer software on the market, harried microcomputer managers are churning through products trying to separate hype from features. Examining a number of products, "Software Digest Rating Newsletter" claims to have made six interesting discoveries:

- Applied Software Technology's Versa Form requires three hours and 40 minutes to process data that Software To Go's Omnifile sorts in four seconds.
- Powertext, a word processor from Beaman Porter, Inc., is so difficult to use that a typical first user can spend an entire day with the program and not be able to print a simple letter.
- Pyramid Data Ltd.'s Number Cruncher costs $100, but before buyers can work with the product, they must spend an additional $39.95 for a user's manual.
- Visicorp's Visi Plot doesn't support a plotter.
- Intesoft/Schuchardt Software Systems's Intecalc, priced at $295, and Datamension's Report Manager, which costs $495, are identical programs.
- Sorcim Corp.'s Supercalc is rated as one of the best graphics programs as well as being a useful integrated package.

"There have been a number of surprises since we started testing different packages," said Harold Poliskin, associate publisher at "Software Digest." "Some companies promise more than they can deliver; the programs aren't as easy to use or operate as they claim. Other products have

See **TESTS** page 70

Micros boosting mid-range systems

By Tom Henkel
CW Staff

The proliferation of microcomputers appears to be pumping new life into the market for larger mid-range systems — a turn of events that may revive the somewhat stale office automation concept.

At least three major systems vendors that attended this month's National Computer Conference have set their sights on the same general user — the microcomputer-riddled company with a desperate need to coordinate and control the work being done on micros.

While their approaches differ, NCR Corp., NEC Information Systems, Inc. and Motorola, Inc.'s Information Systems Group all want the same thing — an entry into what the firms' executives hope will be the next big market for computer systems. Executives from the three companies said customers have been begging for a product that offers the means to coordinate and control the use of stand-alone microcomputers.

The three firms all appear to be trying to build upon their current installed user base in hopes of making their newly announced products successful enough to draw the attention of stand-alone micro users.

NCR and NEC Information Systems introduced products they claim will provide coordinated office automation functions, while Motorola came to NCC '84 ready to give a glimpse of a new corporate structure aimed at developing office-oriented

See **OFFICE** page 70

SMALL TALK
Eric Bender
CW Senior Editor

Macintosh riding micro wave's crest

This year's National Computer Conference, a dull show, did give a good snapshot of the waves of product introductions currently flowing through the microcomputer industry.

Even many of those outside the Apple Computer, Inc. camp agreed that the Macintosh is riding the crest of a wave. "The [Macintosh] is beginning to capture the hearts and minds of the personal computer market," said John Rowley, president of Digital Research, Inc. "It seems pretty clear it's not just a retail product."

The Macintosh hit the market last winter in a remarkable state of undress — no second disk drive, no hard disk storage, no letter-quality printing, no local-area network and (of course) no software. Apple has pulled off a dazzling market triumph anyway, shipping more than 100,000 Macintoshes to date and planning to double manufacturing capability.

And Apple and third-party vendors are slowly filling in the gaps, with many results displayed at NCC. Those who made the trek to the desert could find Macintosh disk drives and a host of other hardware enhancements, while dozens of software packages were on display.

Apple's booth was jammed, but the IBM Personal Computers and compatible machines, which dominate the market, held a lower profile at NCC. The new IBM-compatible systems from AT&T and Compaq Computer Corp., based on Intel Corp. 8086 processors, drew considerable attention, but the handful of 8088-based personal computers did not. The trade show peak for that generation of machines may have been last year's Comdex/Fall, a larger meeting than NCC. One estimate suggested that more than 10,000 IBM Personal Computers were on display at Comdex/Fall '83.

IBM can do whatever it wants whenever it pleases, but as Personal Computers pile up on dealer shelves, many signs point toward the debut of a more powerful Big Blue micro in the next few months.

"[Personal computers] themselves can be likened to dinosaurs, and we're entering the Ice Age, although the end is not in sight next month," Rowley claimed.

NCC also featured the ongoing battle beween two traditional opponents, local-area networks and multiuser microcomputers. On the multiuser system side, the new twist was systems whose workstations run Microsoft Corp.'s MS-DOS and whose host runs multiuser software — either under a proprietary operating system or some version of AT&T's Unix. This new charge came from Morrow, Inc.; NCR Corp.; North Star Computers, Inc.; Televideo Systems, Inc.; and others.

On the network side, vendors demonstrated some packages from the early crop of multiuser applications software.

Among the missing at NCC were most large microcomputer software vendors

See **NCC** page 69

Sony unveils color monitors for IBM micro, graphics package

PARK RIDGE, N.J. — Sony Communication Products Co. has introduced two color monitors for the IBM Personal Computer that incorporate the firm's Trinitron color system. Sony also announced a graphics software package for its SMC-70 and SMC-70G microcomputers.

The monitors reportedly also interface with other personal computers, including the SMC-70.

They offer red-green-blue analog-transistor-transistor-logic processing and a dot pitch of .25mm, according to Sony.

The pixel resolution of the 9-in. screen monitor, the CPD-9000, is said to be 800 dots by 240 lines, while the pixel resolution of the 12-in. screen monitor, the CPD-1201, is 640 dots by 240 lines.

The monitors offer a horizontal shifter for adjusting screen position, a feature that permits automatic horizontal centering of graphics with no need to reprogram graphics, according to the company.

The new software package, the Graphics Management System, is said to be targeted at video production houses, video graphics producers, cable television stations and other organizations.

It offers a paint system with a 16-color palette, a font and text generator, overlay animation and post-production graphics management, according to a Sony spokesman.

The Graphics Management System is priced at $1,500. The monitors each cost about $600.

Information is available from Sony Communications Products, which is located at Sony Drive, Park Ridge, N.J. 07656.

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Prentice-Hall extends graphics line

OLD TAPPAN, N.J. — Prentice-Hall, Inc. has introduced a version of its VCN Execuvision presentation graphics program that runs under Microsoft Corp.'s MS-DOS 2.0 or 2.1 and is compatible with the IBM Personal Computer XT.

Features include automatic chart plotting capabilities; 10 text fonts; choice of foreground and background colors in up to 64 combinations; and a range of electronic tools to sketch, erase, copy, combine and move images.

Current users may upgrade their package to MS-DOS 2.0/2.1 format by exchanging their 1.1 format disks and paying a $50 fee. After the basic program disk is exchanged, new backup disks are available free to those who bought them for the 1.1 version.

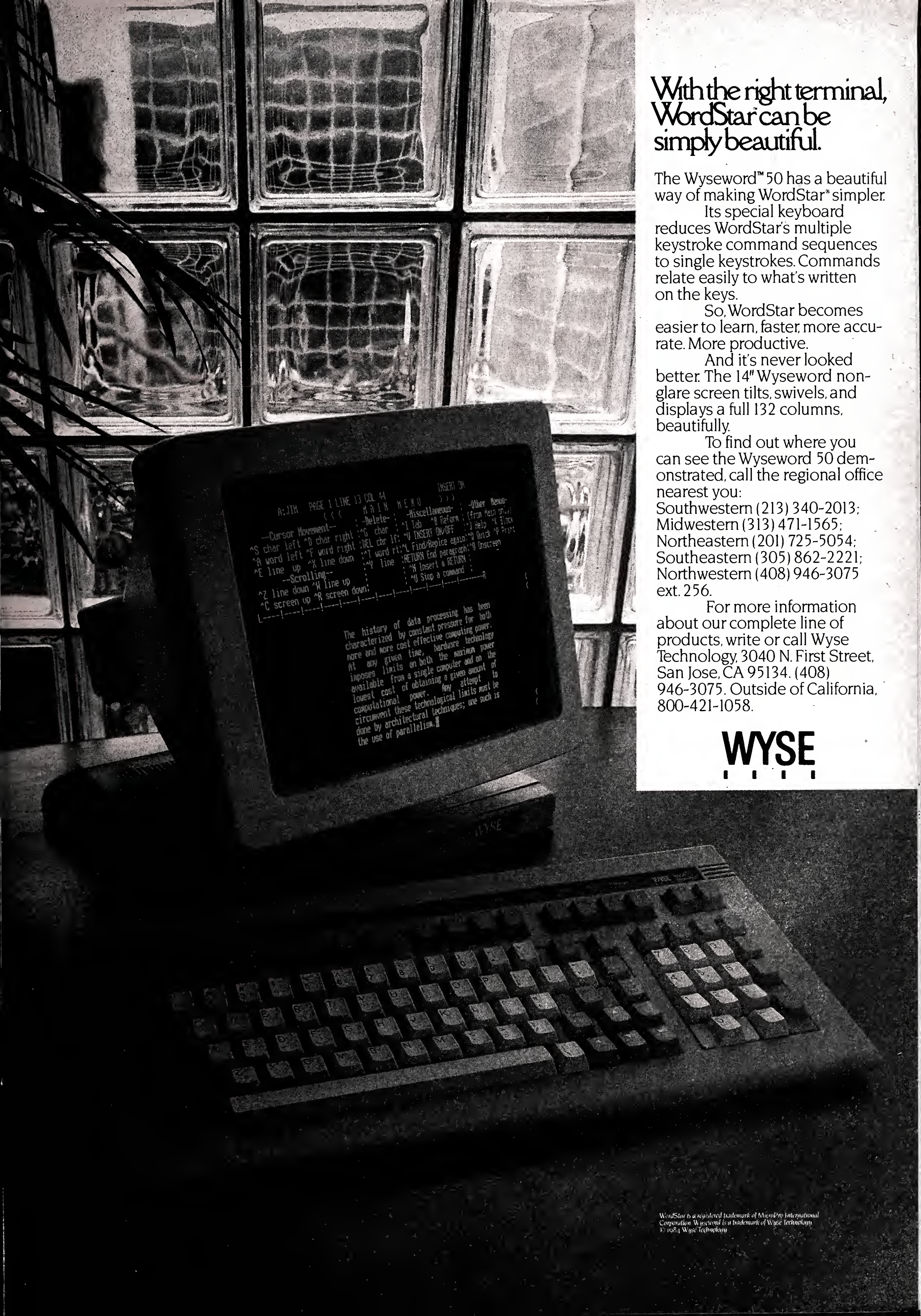
The VCN Execuvision MS-DOS 2.0/2.1 version, which requires a color/graphics board and a color monitor, is priced at $395, according to the vendor.

Prentice-Hall also announced its first six add-on Graphics Libraries for VCN Execuvision. Each library contains dozens of prerendered drawings, symbols, maps or other images, which can be incorporated into presentations, according to the vendor.

The software libraries are grouped by theme and consist of: the Border Collection, the Initials & Decorative Design Collection, the Industry & Business Catalog Collection, Professions: The Faces & Figures Collection, the International Symbols & Landmarks Collection and the Maps & Regions Collection.

The Industry & Business Collection and Professions: The Faces & Figures Collection cost $90 apiece. The other libraries cost $80 apiece.

Additional information is available from Prentice-Hall's Business and Professional Division, located at 200 Old Tappan Road, Old Tappan, N.J. 07675.



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^S char left ^D char right :^G  char  : ^I Tab   ^B Reform : (from Main only)
^A word left ^F word right :DEL chr lf: ^V INSERT ON/OFF   : ^J Help  ^K Block
^E line  up   ^X line down :^T word rt:^L Find/Replce again:^Q Quick ^P Print
       --Scrolling--       :^Y  line  :RETURN End paragraph:^O Onscreen
^Z line down ^W line up    :          : ^N Insert a RETURN :
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MICROCOMPUTERS

Columbia Data Products offers IBM-compatible microcomputer

COLUMBIA, Md. — An IBM-compatible personal computer with built-in 10M-byte hard disk and 10M-byte internal tape backup has been introduced by Columbia Data Products, Inc. Columbia's Professional reportedly comes bundled with a library of software that includes word processing, spreadsheet, communications, graphics and other packages.

The Professional is said to feature 640K bytes of random-access memory and two diskette drives. The Professional uses an Intel Corp. 8088 microprocessor, operating at 4.8 MHz. A basic system includes a color graphics controller, parallel port, two serial ports and four available expansion slots, Columbia said.

Bundled software reportedly includes Microsoft Corp.'s MS-DOS 2.1; Perfect Software, Inc.'s Perfect Filer, Perfect Writer, Perfect Speller, Perfect Calc and Perfect Link; and Innovative Software, Inc.'s TIM 4 data base management system and Fast Graph graphics software.

The Professional will be priced at $5,995 with the bundled software. Shipments are scheduled to begin in September.

Columbia Data Products is located at 9180D Rumsey Road, Columbia, Md. 21045.

NEC unwraps series of drives, IBM micro-compatible printer

BOXBOROUGH, Mass. — An IBM Personal Computer-compatible, letter-quality printer — the Spinwriter 8850 — and three diskette drives have been introduced by the peripherals division of NEC Information Systems, Inc.

The Spinwriter 8850 reportedly offers automatic proportional spacing, bold and shadow printing, margin justification and centering. It is said to be the first Spinwriter equipped with two-digit display operator prompts. The Spinwriter 8850 is said to be compatible with the NEC 3350 and 2050 Spinwriters, the vendor said.

Two of the three new diskette drives handle 3½-in. diskettes. The FD 1034 and FD 1035 offer 500K bytes and 1M byte of storage, respectively, and are said to operate with an access time of 3 msec. The third diskette drive, the FD 1155, reportedly offers 1.6M-byte capacity on 5¼-in. diskettes.

The Spinwriter 8850 is priced at approximately $2,495. The FD 1030 series drives are priced at under $120 in OEM quantities. The FD 1155 costs under $200 in OEM quantities.

NEC Information Systems is located at 1414 Massachusetts Ave., Boxborough, Mass. 01719.

Nestar nets get hubs, SNA gate

PALO ALTO, Calif. — Nestar Systems, Inc. has introduced a line of six- and 16-port Arcnet Hubs and an IBM Systems Network Architecture (SNA) Gateway, both for use with its Plan series of local-area networks for microcomputers.

The Nestar IBM SNA Gateway reportedly allows a dedicated IBM Personal Computer on the network to emulate a remote IBM 3274 unit supporting up to 16 user stations per gateway. The gateway station reportedly interfaces with mainframes that support IBM 3270 protocols.

Nestar's hubs are said to connect either Datapoint Corp. Arcnet RG-62 coaxial cable, IBM Cabling System cables or a 200-micron-core-diameter standard fiber-optic cable.

The company said the hubs act as wiring concentrators and provide signal conditioning that permits up to 22,000 ft of coaxial cable to lie between any two nodes, with up to 2,000 ft of coaxial cable between any two hubs or between a hub and a node. Use of fiber-optic cable reportedly allows the 2,000-ft limit to be extended to 4,000 ft.

Nestar's IBM SNA Gateway is priced at $3,000 for the emulator cluster and $200 per workstation. The 6-port Hub is priced starting at $595, and the 16-port Hub is priced starting at $1,095.

Nestar Systems is headquartered at 2585 E. Bayshore, Palo Alto, Calif. 94303.

SOFTWARE

MICRO FOCUS, LTD.
Programming tools

Micro Focus, Ltd. has announced that some of its programming tools will be available for the IBM 3270 Personal Computer/G and 3270 Personal Computer/GX graphics workstations by the end of this year, concurrent with the machines' delivery by IBM.

Included in the offering will be the firm's high-performance Level II Cobol compiler, Personal Cobol integrated programmer's tool kit, Anima-

See **TOOLS** page 64

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MICROCOMPUTERS

Radio Shack TRS-80 Model 16B gets TRX-Xenix-based compiler

FORT WORTH, Texas — Radio Shack has introduced Pascal-2, a compiler for its TRS-80 Model 16B multiuser microcomputer system based on its TRX-Xenix operating system.

The product reportedly allows Pascal programs to be ported to the Model 16B and permits Pascal programmers to write applications for that system.

Pascal-2 performs 10 types of code optimization: small code, global register allocation, common subexpression elimination, expression targeting, array index simplification, branch-tail merging, range tracking, constant folding, dead code elimination and short-circuit evaluation, Tandy said.

Pascal-2 detects uninitiated variables and other errors while avoiding ripple effects from previous syntax errors, a spokesman said.

Pascal-2 programs can call subroutines written in C or assembler. The compiler's language extensions provide I/O handling and access to low-level TRS-Xenix operations.

Pascal-2 costs $699, according to the spokesman.

Radio Shack is based at 1800 One Tandy Center, Fort Worth, Texas 76102.

TOOLS

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tor source code debugger and Forms-2 source code generator, the vendor said.

Prices for the products in single-user, single-quantity sales are: Level II Cobol, $1,595; Personal Cobol, $395; Animator, $795; and Forms-2, $195.

Micro Focus, Suite 400; 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

LIFEBOAT ASSOCIATES, INC.

Dr. Halo

Lifeboat Associates, Inc. has released Dr. Halo, a color computer painting program designed for the IBM Personal Computer.

Developed by Media Cybernetics, the program features icons such as an eraser, pencil, paint can and airbrush. Users can paint using either a mouse or the keyboard, according to Lifeboat.

Dr. Halo reportedly provides users with the ability to draw, paint, move, cut and paste and "rubber-stamp" images. It includes six type fonts, the vendor said.

Dr. Halo requires an IBM Personal Computer or compatible and a Personal Computer-compatible color graphics adapter. The package costs $99.95.

Lifeboat Associates, Department C, 1651 Third Ave., New York, N.Y. 10128.

BORLAND INTERNATIONAL

Turbo Toolbox

Borland International has announced Turbo Toolbox, which includes tools designed for programmers writing software in Pascal for data bases, address books or any other application where search-and-sort capabilities are important.

The Toolbox was developed to complement Borland's Turbo Pascal compiler for Zilog, Inc. Z80 and Intel Corp. 8088/86 microcomputing environments, the company said. The Toolbox includes Turbo-Isam on disk, Quicksort on disk and General Installation Program (Ginst).

Turbo-Isam allows users access to file records on key searches, the company said. Direct access reportedly is available to records in a sorted sequence. Source code for the Turbo-Isam module is provided in the Turbo Toolbox user manual, so that programmers can develop customized software.

Procedures for Quicksort, a sorting utility, also are implemented in Turbo Toolbox, the vendor said. Quicksort is said to be available with commented source code to facilitate program development.

With Turbo Toolbox's Ginst terminal installation module, programs written in Turbo Pascal can automatically be up and running on any terminal used with Z80 and 8088/86-based microcomputers, the company said.

Turbo Toolbox is priced at $49.95, the vendor said.

Borland International, 4113 Scotts Valley Drive, Scotts Valley, Calif. 95066.

SYSTEMS

SMOKE SIGNAL BROADCASTING, INC.

VAR/68K

Smoke Signal Broadcasting, Inc. has announced a series of 16-bit, Unix-based desktop computers with disk capacities up to 150M bytes.

The VAR/68K series incorporates the 16-bit Motorola, Inc. 68000 microprocessor and Alcyon, Inc.'s Regulus operating system, which the vendor said is Unix-compatible. The systems use the SS-50 bus architecture originated by Southwest Technical Products, Inc., the company said.

Six levels of systems are priced from $7,900 to $25,000, depending on configuration, the vendor said.

Minimum configuration for a VAR/68K includes the CPU, a single terminal with keyboard, 1M byte of flexible disk storage and 5M bytes of hard disk storage, eight RS-232C seri-

See **SYSTEMS** page 66

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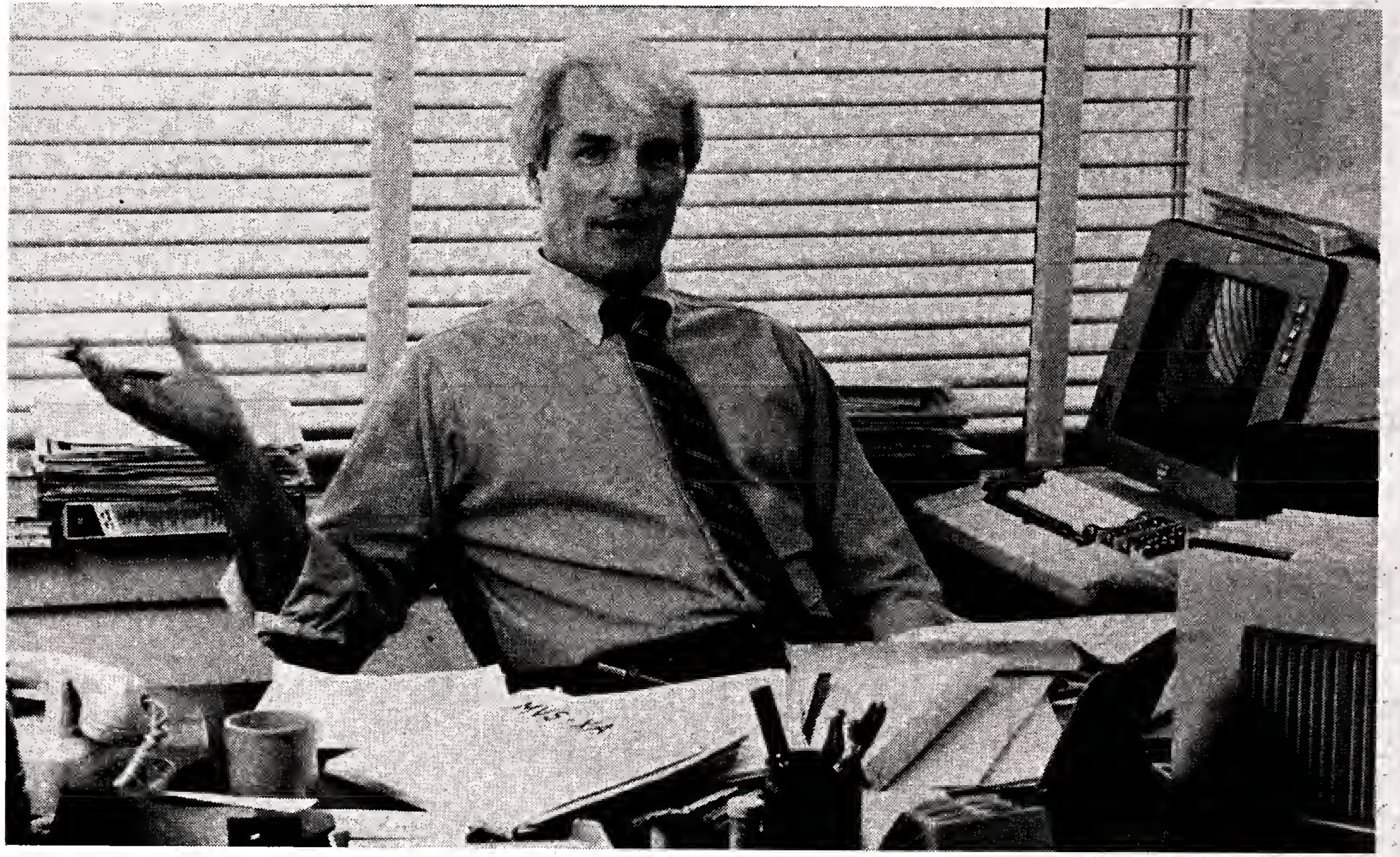

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Software Corporation of America

*Comments from interviews with EasyPROCLIB users.
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MICROCOMPUTERS

SYSTEMS

from page 64

al ports, a Centronics Data Computer Corp.-type parallel port and the Regulus operating system.

Fully configured systems include 1M byte of random-access memory, 150M bytes of hard disk storage, 60M bytes of ¼-in. streaming-tape backup, 16 serial ports and four 8-bit parallel ports.

Smoke Signal Broadcasting, 31336 Via Colinas, Westlake Village, Calif. 91362.

MORROW, INC.

MD16; MD34

Morrow, Inc. has added two microcomputers with hard disk storage to its Micro Decision line.

The MD16 offers 16.4M bytes of storage, and the MD34 offers 34.4M bytes of storage, according to Morrow.

They are said to run under the Digital Research, Inc. CP/M 3.0 operating system and to include a full-size terminal and six application software packages.

Both models reportedly are single-board computers based on the Zilog, Inc. Z80A microprocessor and feature 128K bytes of random-access memory, a 400K-byte diskette drive, a parallel port, two RS-232 serial ports and another port that offers either RS-232 or RS-422 operation.

A spelling checker, word processor, data base manager and other software are provided with either model.

The MD16 is priced at $3,495, and the MD34 is priced at $4,995.

Morrow, 600 McCormick St., San Leandro, Calif. 94577.

SPECTRA SYSTEMS, INC.

Athena

Spectra Systems, Inc. has announced Athena, a multiuser, multitasking microcomputer.

Athena features Intel Corp. IAPX286 and IAPX287 and Zilog, Inc. Z80B microprocessors, 256K bytes of random-access memory (expandable to 2M bytes), a 640K-byte floppy disk drive, four serial ports, two parallel ports, a 14-in. intelligent terminal and a storage expansion box.

Options reportedly include a high-bandwidth multibus, a ¼-in. tape streamer and 380M bytes of hard disk storage. Athena can support 24 users and includes parallel, direct memory access and bisynchronous communications ports.

The system supports Digital Research, Inc.'s CP/M, Microsoft Corp.'s MS-DOS and Unix operating systems, Spectra said.

Athena costs $11,995.

Spectra Systems, 2754 Compass Drive, Grand Junction, Colo. 81505.

COMMUNICATIONS

COMMUNICATIONS RESEARCH GROUP, INC.

Blast for the TI Professional

Communications Research Group, Inc. has announced that its Block Asynchronous Transmission (Blast) software is now available for the Texas Instruments, Inc. Professional personal computer.

Blast, designed to let systems communicate with other systems using Blast, previously was available on about 60 microcomputers, minicomputers and mainframes, the company said.

The package reportedly uses techniques similar to synchronous communications, such as sliding windows and pipelining, to transfer Microsoft Corp. MS-DOS files on a TI Professional to IBM Personal Computers, Digital Equipment Corp. VAX-11 superminicomputers under VMS, Apple Computer, Inc. microcomputers under Digital Research, Inc.'s CP/M or any other system using Blast.

Blast costs $250 for micros.

Communications Research Group, 8939 Jefferson Highway, Baton Rouge, La. 70809.

CERMETEK MICROELECTRONICS, INC.

Infor-Mate 1200

Cermetek Microelectronics, Inc. has announced Infor-Mate 1200, a 110, 300 and 1,200 bit/sec modem that is compatible with Hayes Microcomputer Products, Inc. modems.

The modem reportedly features automatic answering, speed selection and dialing and incorporates a speaker that enables the user to hear the progress of an autodialed call. The product allows the user to turn down the modem speaker volume and follow a call's progress by messages printed on the screen, Cermetek said. Two front panel buttons are available to multiplex voice and data, according to the vendor.

Infor-Mate 1200 costs $595.

Cermetek Microelectronics, P.O. Box 3565, 1308 Borregas Ave., Sunnyvale, Calif. 94088.

MICRO-MRP, INC.

Technical Support Module

Micro-MRP, Inc. has introduced its Technical Support Module, which reportedly allows data files and Micro-MRP software releases to be transmitted directly into a user's computer system.

The module is the latest enhancement to the firm's MAX, The Production Manager manufacturing resource planning software system for the IBM Personal Computer. It is said to permit users to receive the firm's software releases via a modem.

The module also is said to allow users to transmit a problem data file to a customer representative at the firm's headquarters for review.

The Technical Support Module is priced at $1,000.

Micro-MRP, 1065 E. Hillsdale Blvd., Foster City, Calif. 94404.

The Goal News

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ALERT/CICS's major features	CICS's security features	Security you've employed
Operator security	YES	
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Random generation of passwords	NO	
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On-line menu driven facilities to define security	NO	
Violation logging	NO	
Automatic distribution of passwords	NO	
Encrypted security information	NO	
Security for files and maps	NO	
Allows operator to sign on at one terminal at a time	NO	
Online display of violations	NO	

In 1981, a study by Hubbard Research revealed that "overall confidence in security provided by CICS is minimal . . . and that CICS users feel the system's security provisions are inadequate for an expanding on-line usage." Since that time, software advances have brought thousands of additional end-users and hundreds of new remote locations into the on-line environment.

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STORAGE

PANASONIC INDUSTRIAL CO.
Floppy disk drive series

Panasonic Industrial Co.'s Computer Components Division has introduced six 3-in. floppy disk drives designated the EME-102/202, EME-150/250 and EME-130/230.

The drives reportedly offer unformatted storage capacities ranging from 250K bytes to 1M byte.

All drives in the series are said to be plug-compatible with popular 5¼-in. disk drive interfaces and take up roughly one-quarter the volume and half the weight. The drives are 90mm wide, 150mm deep and 40mm high.

Features of the drives reportedly include single-button diskette ejection/insertion and direct-drive brushless motor. Also provided are an in-use light to prevent accidental diskette removal.

The series of drives is priced between $125 and $200 each in lots of 1,000.

Panasonic Industrial, Computer Components Division, One Panasonic Way, Secaucus, N.J. 07094.

LOGICOM TECHNOLOGY, INC.
LTI-5150

Logicom Technology, Inc. has introduced a disk drive controller board, which allows installation of Seagate Technology, Inc.'s ST412 half-height Winchester disk drives for IBM Personal Computers and compatible machines.

The controller, designated the LTI-5150, allows for automatic boot from hard disk when the IBM DOS 2.0 operating system is used with the personal computers using a 256K-byte motherboard, Logicom said.

The price of the LTI-5150 is $395.

Logicom Technology, 560 Forbes Blvd. S., San Francisco, Calif. 94080.

DAVONG SYSTEMS, INC.
Datasystem

Davong Systems, Inc. has announced a combination hard disk and backup system for the IBM Personal Computer and Personal Computer XT.

Davong Datasystem is available in 10M-, 21M-, 32M- and 40M-byte capacities, each with a 24M-byte tape backup built in. Prices range from $3,295 to $4,995.

Features include an on-line performance option, compressed or full-volume backup, file-by-file or full-volume restore and automatic flaw mapping, the company said.

Davong Systems, 217 Humboldt Court, Sunnyvale, Calif. 94089.

INTERPHASE CORP.
RDS 375

Interphase Corp. has introduced a 75M-byte subsystem for use with IBM Personal Computers and compatibles.

The RDS 375 features the firm's Maverick Storage Module Drive (SMD) PC-80 controller, with a Century Data Systems, Inc. C2075 8-in. SMD disk drive, a spokesman said.

The C2075 disk offers 50M bytes of fixed storage and 25M bytes of removable cartridge storage, according to the vendor.

The RDS 375 subsystem also reportedly offers spiral formatting and error correction. It is provided with three spare cartridges, fan and power supply, among other features, the spokesman said.

The RDS 375 is priced at $9,495.

Interphase, 2925 Merrell Road, Dallas, Texas 75229.

NORTH ATLANTIC INDUSTRIES, INC.
Ramtape-PC

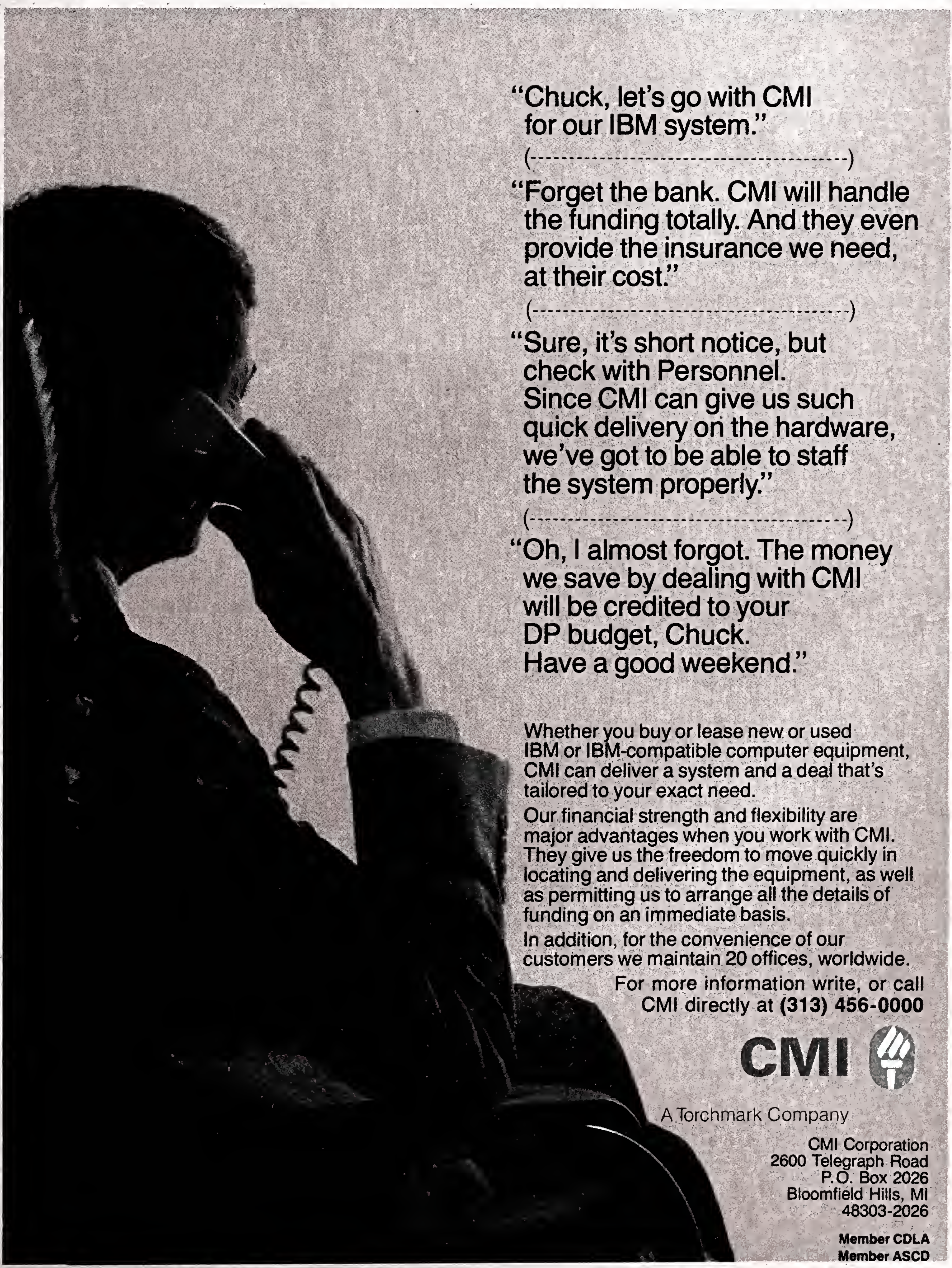
The Qantex Division of North Atlantic Industries, Inc. has introduced a triple-purpose mass storage device for IBM Personal Computers, Personal Computer XTs and compatible systems.

The Ramtape-PC peripheral provides backup for hard disk data in three modes: file-oriented, volume-oriented or image-oriented. It is a desktop unit with 512K bytes of memory, ¼-in. cartridge tape drive, power supply and host adaptor circuit card.

The Qantex Ramtape-PC costs $1,995 for the 32K-byte random-access memory (RAM) version and $2,295 for 360K bytes of RAM. Volume shipments begin in October.

North Atlantic Industries, Qantex Division, 60 Plant Ave., Hauppauge, New York 11788.

See **STORE** page 68



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STORE from page 67

DRAGON INDUSTRIES
SPT-65; SPT-140

Dragon Industries has announced a streamer tape backup option in 5¼-in. format for its SP-65 and SP-140 disk drives, which are available for the IBM Personal Computer, Personal Computer XT and compatible systems.

The SPT-65 and SPT-140 feature a capacity of 45M and 60M bytes, respectively.

The SPT-65 package includes the hard disk, host adapter, power supply, cable and chassis and the tape unit itself for $6,996. The SPT-140 sells for $8,995.

Dragon Industries, 35 Main St., Hopkinton, Mass. 01748.

FORTUNE SYSTEMS CORP.
Tape streamer; storage expansion options

Fortune Systems Corp. has announced a 20M-byte tape streamer backup system for the Fortune 32:16 computer, along with expansion options for the 32:16's disk drive expansion cabinet.

Fortune computers running the FOR:PRO 1.7 operating system can be upgraded to support the tape streamer, which reportedly reads and writes data on ¼-in. cartridges at up to 90K byte/sec.

Included with the hardware is a Motorola, Inc. 68000 CPU-based parallel I/O controller with 128K bytes memory occupying one CPU I/O slot.

Price of the expansion cabinet with the tape in it is $3,750. The cabinet with a 5¼-in., 30M-byte hard disk drive sells for $5,995. Price of the cabinet with disk and tape drives is $7,495. Adding drives costs $4,600.

Fortune Systems, 101 Twin Dolphin Drive, Redwood City, Calif. 94065.

PRINTERS/ PLOTTERS

CENTRONICS DATA COMPUTER CORP.
Printstation 240, 250

Centronics Data Computer Corp. has introduced two new printers, its Printstation 240 and Printstation 250.

Printstation 240 reportedly offers a 24-pin dot matrix print head and is designed to provide high-density printing of 10 picas or 12 elite char./in. It also is said to features compatibility with systems designed to communicate with dot matrix or daisywheel printers. Used in a dot matrix system, Printstation 240 can produce pin-addressable graphics and print condensed, enlarged and emphasized characters.

Printstation 250 reportedly offers 80-col. dot matrix printing for workstation applications and personal computers. It also reportedly offers four- or seven-color printing, charts and graphs and an LED control panel for operator prompting, setup selection and diagnostics.

Printstation 240 costs $1,495, and Printstation 250 costs $1,299, the vendor said.

Centronics Data Computer, 1 Wall St., Hudson, N.H. 03051.

ERGO SYSTEMS, INC.
Hush 80

Ergo Systems, Inc. has announced the Hush 80 portable 80-col. dot matrix thermal printer.

The 28-oz Hush 80 features bidirectional printing at 80 char./sec and graphics at 4,800 dot/sq in., according to the vendor. The Hush 80 measures 11.63 in. by 5.5 in. by 2.8 in.

The Hush 80 is offered in three models, each of which can take a rechargeable nickel-cadmium battery pack as an option. The Model Hush 80CD provides direct interfacing to Commodore Business Machines, Inc. microcomputers. The Hush 80P is a Centronics Data Computer Corp.-type parallel interface version, while the Hush 80S provides a serial RS-232 interface, the company said.

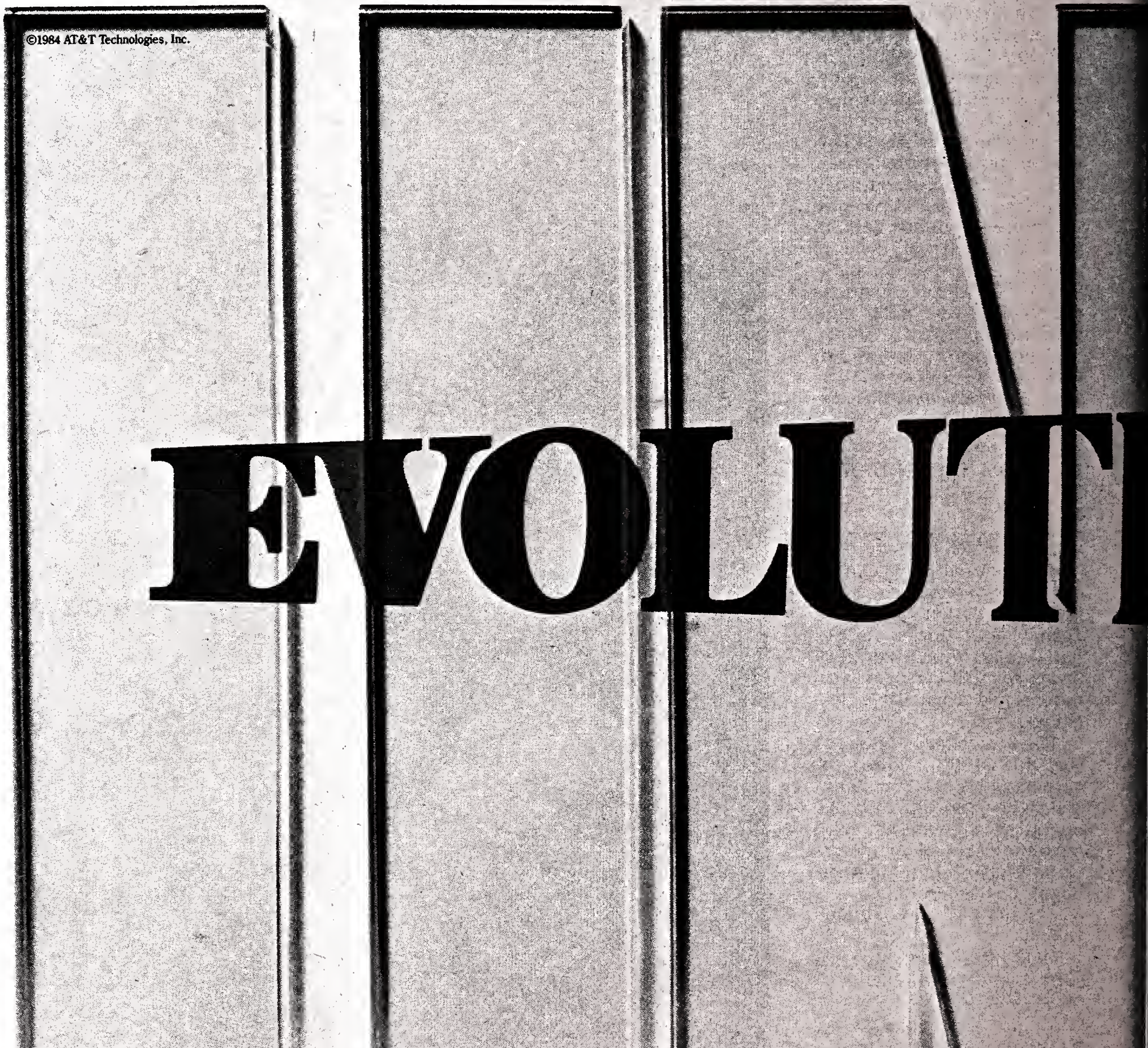
List price is $159.

Ergo Systems, 1360 Willow Road, Menlo Park, Calif. 94025.

KAYPRO CORP.
Kaypro Letter Quality Printer

Kaypro Corp. has announced Kaypro Letter Quality Printer, a daisywheel printer designed for microcomputer users.

The printer features a 2K-byte buffer that can be expanded to 8K bytes, a three-pitch range, proportional spacing, drop-in print wheel, snap-in cartridge ribbon and a Centronics Data Computer



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Corp. parallel interface, Kaypro said.

The printer weighs 27½ lb, has a maximum paper width of 11 in. and a printing speed of 18 char./sec, according to the vendor spokesman.

The Kaypro Letter Quality Printer is priced at $599. An optional tractor feed sells for $150, and a printer cable is priced at $49.95, the vendor said.

Kaypro, 533 Stevens Ave., Solana Beach, Calif. 92075.

ZILOG, INC.
VTZ 3/20

Zilog, Inc. has introduced an intelligent terminal, the VTZ 3/20, for use with its multiuser Unix-based System 8000 supermicrocomputer family.

The VTZ 3/20 reportedly features a 12-in. CRT with dynamic focusing and a 25-line by 80- or 132-col. display. It replaces Zilog's VTZ 2/10 line of 80-col. display terminals, according to the vendor.

The terminals are said to offer a 103-key, detachable keyboard with 16 function keys, each with two shift modes. The terminals also reportedly feature 256 graphics characters and 128 alphanumeric characters in a high-density font. The display is mounted on a tilt-and-swivel base.

The VTZ 3/20 is priced at $1,295.

Zilog, 1315 Dell Ave., Campbell, Calif. 95008.

CAL-ABCO
Model 880 printer

CAL-Abco has announced the Legend Brand Model 880 dot matrix printer, with 80-col. standard or 142-col. compressed line capability.

The Model 880 offers 40 character fonts, which can be mixed on a single line, the company said.

Other features include bidirectional logic-seeking operation and 8-bit Centronics Data Computer Corp.-type standard interface. The interface is compatible with Epson America, Inc. microcomputers, and the Model 880 accepts RS-232 interfaces as well, the vendor said.

Data for the 880 can be inputted for buffering at any rate up to 4,000 char./sec, the company said.

The printer is said to generate 228 Ascii-standard characters and high-resolution graphics with a 9-wire printhead warranted for 50M characters, the company said.

Model 880 handles single sheets, 3-part z-fold paper or mailing labels, according to the vendor. Paper width is adjustable from 4 inches to 10 inches.

The printer sells for $279, the vendor said.

CAL-Abco, 14722 Oxnard St., Van Nuys, Calif. 91401.

See **PRINT** page 70

NCC from page 59

and the wave of 16-bit laptop computers predicted to break this summer.

Manufacturers have held back from laptop introductions, waiting for one of the early entrants to go beyond niche sales. Other slowdowns come from hardware limitations. "Everyone's waiting for a [25-line by 80-char.] screen available in volume," Microsoft President Jon Shirley commented.

"Why would you want to introduce something now and get stomped on by someone who comes out with that in a few months?"

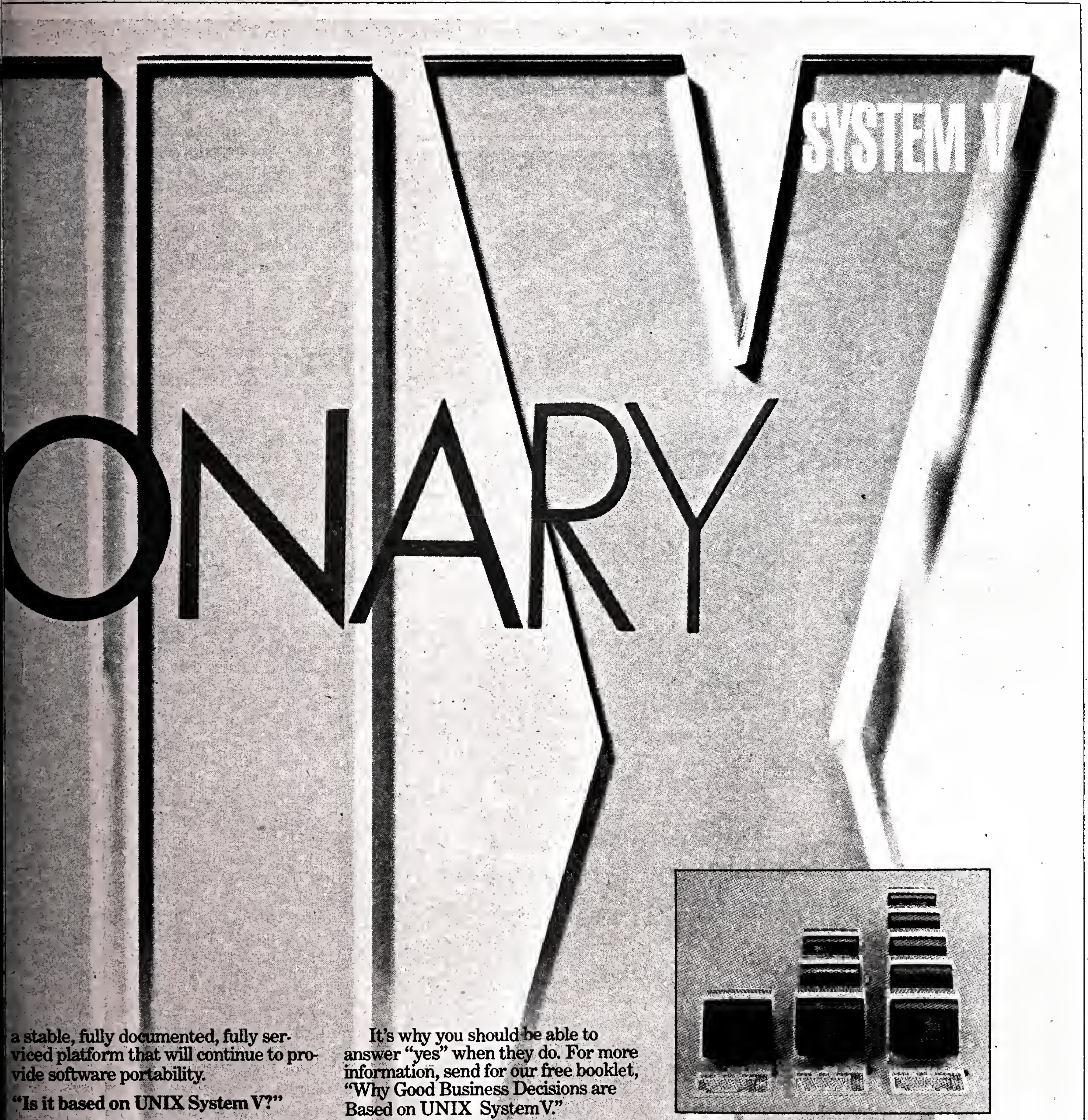
Dropping hints

On the systems software front, Digital Research keeps dropping hints about its Crystal operating environment, even though Crystal has not been officially announced. The latest hint came in Las Vegas, where Rowley called Crystal "the most incredible form of Glass."

According to rumor, Glass is an operating environment IBM is developing for that next-generation personal computer. But it is far from clear what Glass would incorporate and what Digital Research's role would be.

Meanwhile, Microsoft's Windows operating environment has almost dropped from sight, a few months before it hits the street. The systems software has many hardware and software licensees, but it is not clear how far the support goes in each case. Many suppliers seem to be waiting to see where the market goes before solidly committing to Windows.

"We do think it's a good product, we do think it will be important to the industry, and we're behind it all the way," said Compaq President Rod Canion.



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PRINT from page 69

STROBE, INC.
M260 version with 1-2-3 interface

Strobe, Inc. has released a new version of its M260 plotter with a Lotus Development Corp. 1-2-3 compatible interface included as a standard feature.

Designed as a desktop unit, the M260 is an eight-pen plotter that measures 10¼ in. deep and 16¾ in. wide. The M260 is supported by Strobe's Enhanced Business Graphics, Strobeview software and Strobe's line of pens, paper and overhead transparency material.

Price of the M260 is $995.

Strobe, Building 5A, 897 Independence Ave., Mountain View, Calif. 94043.

CHIEFS from page 59

80% of the total respondents — was spreadsheet/budget planning software. Spreadsheets were followed by word processing software and then by data base/file management software, which Dickie said showed a strong upsurge over last year. Rounding out the preference list were, in order, graphics tools, decision support systems and applications generators.

A question on spreadsheet software showed Lotus Development Corp.'s 1-2-3 package by far the most popular, in use at 65% of the firms. Its closest competitor, Visicorp's Visi Calc, held only a 15% share.

As for how their spreadsheet software was acquired, the survey found that 74% of total respondents bought, while 6% developed it themselves and 20% used a combination.

TESTS from page 59

proven to be much better than we expected."

Each month, 10 users test 20 packages for the newsletter. "Each person follows a standard procedure and spends one day working with the package," Poliskin explained. "At the end of the day, he completes a questionnaire that rates the product's ease of use, ease of setup and capabilities."

The tests attempt to simulate the experiences of a novice user in a large corporation. "After a few cycles, we replace our testers, many of whom are teachers or students," Poliskin said. "We've found that the less technical users read manuals more carefully and locate bugs that advanced users often bypass."

"Software Digest" has a full-time technical staff to evaluate "power user" features such as error handling. "We split the ratings into different categories so all types of users can benefit from the 'Digest,' " Poliskin said.

After each tester has worked with all the packages, cumulative scores are tabulated and published in the newsletter, which is published every five weeks. The first issue was published in January. Ten types of packages are scheduled for evaluation this year: word processing, data base and file management, spreadsheet, graphics, time and project management, integrated software, personal accounting, tax and investment, communications and special applications like "thought processing."

"Software Digest" plans to increase its newsletter issue size from 24 to 72 pages. "We will include screen shots and other information which our readers [have] requested," Poliskin said.

The company claims to have 7,500 subscribers. A year's subscription costs $135, while a two-year subscription is available for $240.

"Software Digest" is located at One Wynnewood Road, Wynnewood, Pa. 19096.

OFFICE from page 59

products.

NCR unveiled NCR Officeware, a software package for the firm's Tower 1632 supermicrocomputer that allows companies with disconnected microcomputers, such as IBM Personal Computers, to use a common set of software modules and to share data.

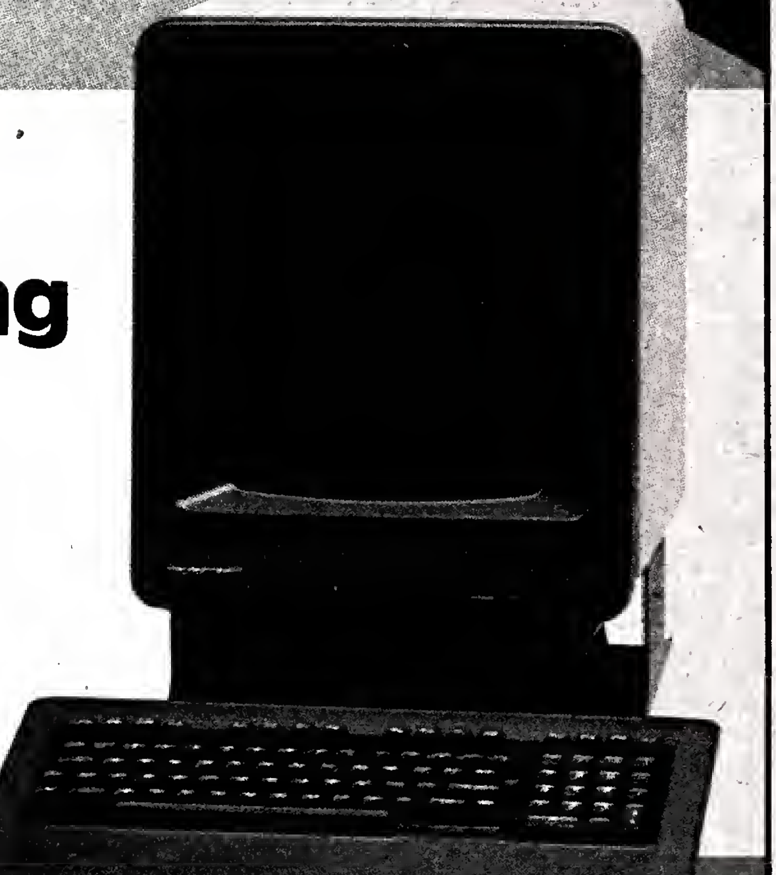
The NCR Officeware package can be run by current Tower 1632 users who have stand-alone IBM or NCR microcomputers installed. But NCR also aims at selling Tower 1632 systems equipped with NCR Officeware to businesses currently using stand-alone IBM or NCR microcomputers, according to Earl West, manager of third-party products for NCR.

NEC Information Systems displayed a 32-bit version of its Astra line of minicomputers, which may find its largest appeal as an OEM office automation system via the separate subsidiaries of local operating companies, according to NEC Information Systems' vice-president of marketing, G. Millard Allen Jr. Part of the operating company strategy is to link various microcomputers to the NEC system, Allen said.

The ambitious Motorola effort made its first public showing at this year's NCC. The Information Systems Group is a cooperative effort by Motorola and two subsidiaries, Codex Corp. and Four-Phase Systems, Inc., to pull together systems, semiconductor and networking products into a series of "back office" products.

Arthur Carr, executive vice-president and general manager of the Information Systems Group, said the group is developing a series of products that will allow corporate users of multiple vendors' microcomputer systems to communicate with each other via Codex networking products and Four-Phase systems.

The Motorola approach, Four-Phase President Howard Thrailkill noted, is to build on the 24-bit Four-Phase installed base with a series of 24-bit products designed to act as back office systems and appeal to a larger market with several 68000-based systems.



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COMPUTER INDUSTRY

IBM to gain 60% of SBS in proposed Comsat bail out

By Peter Bartolik
CW Staff

WASHINGTON, D.C. — Communications Satellite Corp. (Comsat) recently bailed out of the money-losing Satellite Business Systems (SBS) partnership, selling off its holdings to its two partners and giving IBM a majority interest in the telecommunications venture.

Subject to negotiation and execution of a definitive agreement and to the approval of the Federal Communications Commission, Comsat will sell 80% of its SBS holdings to IBM and the remaining 20% to Aetna Life & Casualty Co., the third partner in the venture.

IBM would be left holding a 60% share of the company, and Aetna would own the remaining 40%; each of the three partners currently holds a one-third share in SBS. Aetna reportedly would be allowed to increase its ownership to 50% of SBS within the next 18 months.

Purchase price not revealed

No purchase price was revealed, although Comsat said it expects to realize an after-tax gain of $15 million from the sale of its interest in SBS. Speculation among analysts was that the sale was worth about $60 million.

Charles Robbins, a telecommunications analyst with International Data Corp., a research firm, said the sale probably was based on 1¼ times Comsat's on-paper share of SBS' 1983 revenues of $141.8 million. SBS posted a net loss of $123.1 million for fiscal year 1983 and an additional loss of about $30 million for the first quarter of this year.

Robbins noted that IBM had been expected to gain a controlling interest in SBS, since Comsat earlier this year confirmed it was negotiating the sale with the other two partners. He speculated that an FCC decision earlier this year, lifting a former ban on joint marketing efforts by SBS and IBM salesmen, may have increased IBM's desire for control of SBS. "I think IBM really prefers to get direct control of SBS; this fits around IBM's overall strategy for office communications and networks. [IBM] had not had an opportunity to work directly with SBS before," Robbins said.

Formed in 1975 by the three partners to develop high-speed data and voice communications to large corporations, the venture has soaked up more than $700 million in investment funds from the partners and is expected to require further heavy investment over the next several years. Last year SBS expanded its target customer base by offering its Skyline long-distance phone service to residential and small business customers. In January, Robert Hall was replaced as SBS president by IBM Vice-President Stephen Schwartz.

Robbins noted that most major computer vendors have formed or are presently forming close ties with communications vendors in an effort to offer customers "a turnkey solution with an integrated network." He added, "They are all offering a high-speed gateway capability."

Comsat Chairman and Chief Executive Officer Joseph V. Charyk said the decision to sell was based on the need by SBS for substantial continued capital investment over the next few years "when viewed in the light of Comsat's financial resources and other business activities."

Wang posts record revenues

LOWELL, Mass. — Just two years after attaining the $1 billion sales benchmark, Wang Laboratories, Inc. last week reported that fiscal year 1984 revenues exceeded $2 billion.

For the fiscal year ended June 30, Wang posted record revenues of $2.1 billion, a 42% increase over the $1.5 billion reported for fiscal year 1983.

Profits for 1984 were $210.2 million, or $1.52 per share, an increase of 38% from the profits of $152 million, or $1.16 per share, reported in 1983.

For the fourth quarter, Wang posted revenues of $713.8 million, up 51% from the $471.5 million the firm reported a year earlier.

According to a spokesman for Wang, profits for the quarter were $73.7 million, or 52 cents per share, up 33% from the profits of $55.6 million, or 41 cents per share, reported a year earlier. The spokesman listed some factors that adversely impacted fourth-quarter operating margins. The operating margins, he said, were affected by the continuing strength of the U.S. dollar overseas, by large competitively bid contracts with lower than average margins and by heavy shipments of the accumulated backlog of Wang's Professional Computer.

UK high-tech branch envisioned

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

If anybody needs further evidence that the computer age has arrived, he need only glance across the Atlantic. In the UK, a former adviser to Prime Minister Margaret Thatcher has issued a call for the addition of a new division of government, to be known as the "computeracy."

Norman Strauss, chairman of Growth Tank Corporate Advisers and a director of the British Consortium for Innovation, was invited to add some spice to a press seminar sponsored in France recently by Sperry Ltd., the British subsidiary of Sperry Corp.

Strauss discussed an idea he originally proposed in January — the modification of the existing separation of powers in the British state. He issued a call for "a means of enforcing further checks and balances on an over-mighty and underthinking executive [branch] and its administrative class."

The theoretical model for that modification — and Strauss emphasized repeatedly that he is in the business of offering new theory, not turning it into reality — would be the computeracy. It would be a fourth organ of state, independent of the Parliament, the Cabinet and the judiciary. Using modern technology to collect information, structure it and apply it to specific tasks, the computeracy would essentially tell Parliament and the Cabinet what government is doing wrong and how it can do right.

Strauss has tried molding change from the inside of government. In 1979, he was sponsored by his company to join the No. 10 Policy Unit, a policy advisory group to the Thatcher government.

His ideas were not without challenge. One seminar participant likened his proposal to a gardening consultant telling a gardener that everything attempted to date has been done wrong and should be thrown out.

On the other hand, there was much sentiment expressed by seminar partici-

See **UK** page 82

Co-founder McCormack leaves M&D

NATICK, Mass. — James M. McCormack, chairman and chief executive officer of McCormack & Dodge Corp. (M&D), has resigned from the company and is leaving the software industry.

McCormack, 46, cited a personal need for a career change as the main reason for leaving the company he cofounded with Frank Dodge in 1969.

McCormack

M&D sales grew from $90,000 in 1970 to more than $38 million in 1982, with an average annual growth rate of 87% over the last five years.

He said the rapid expansion of the company, which now employs nearly 1,100 people, was a factor in his decision.

"It's gotten very large, and one reason I got into the business in the first place was to be with something small," McCormack commented.

Foresees no noticeable impact

He added that he believes his resignation will have no noticeable impact on the company.

McCormack was appointed chairman and chief executive officer of the firm in 1980, a position he held at the time M&D was bought by Dun & Bradstreet Corp. in May 1983.

He has increasingly withdrawn from the day-to-day operations in recent years, leaving those duties to Dodge.

The Dun & Bradstreet acquisition set the wheels in motion for McCormack's resignation, he said. "The chairman of the board doesn't do the same things in a subsidiary company as in an independent company," he said. "There was no point in going back to the day-to-day operations because I had done that for 11 years."

He added that he has "always wanted to have a multifaceted career with a lot of pieces in it."

McCormack will be attending MIT in the fall to earn his M.S. degree in real estate development.

He plans to enter that business in the Boston area.

■ During the next 18 months, the Unix System V operating system will be enhanced with an eye to desktop microcomputing, addressing the user needs of limited memory and finding a friendly interface, according to AT&T's Jack Scanlon/**73**

■ The U.S. still holds a technological edge over would-be competitors, but the real issue is bringing the fruits of technology to market promptly, Bobby R. Inman said recently/**72**

Speaker: U.S. must get technology to market in order to stay ahead

By David Olmos
CW Staff

BOSTON — The speed with which U.S. companies can apply new technology and take it to market will be a critical factor in preserving the nation's technological leadership, according to retired U.S. Navy Admiral Bobby R. Inman.

Inman, director of the Microelectronics and Computer Technology Corp. (MCC), a joint research venture of 18 computer companies, said the U.S. still holds a technological edge, but "it's in the application of it where we begin to fall down."

Speaking at a recent high-technology seminar here sponsored by the accounting firm of Arthur Andersen & Co., Inman said the real measure of the success of the joint venture will be whether the participating companies use the new technologies created at MCC's Austin, Texas, facility.

Inman expressed concern whether participating companies will get that technology to market before competitors in Japan or Western Europe. One reason to believe they will, however, is that "they know their competitors have access to that same technology and that if they don't use it, they're likely to be scooped at the marketplace."

Inman, who directed the U.S. National Security Agency from 1977 to 1981, cited two areas of technology where the Japanese have moved ahead of the U.S. — robotics and manufacturing technology. "When [Apple Computer, Inc.] finds it has to go to [Hitachi Ltd.] to design and build the most automated factory . . . it tells of areas where we have fallen behind in application," he said.

Asked why U.S. technology companies had not begun a joint research venture sooner, Inman said it was probably because of concern about antitrust sanctions. He predicted that legislation now pending in Congress that clarifies antitrust sanctions will spur future collaborative efforts in U.S. industries, including such efforts in the computer industry.

Inman said he has been told that antitrust concerns were important factors in the decisions by IBM and AT&T not to join MCC.

The price of admission to join MCC's current 18 shareholders has recently been raised to $500,000 from the original $150,000, Inman said. However, he said, the more significant cost to the companies is the requirement that they fund one of MCC's research programs for at least three years.

Inman said MCC has hired 168 people so far, 132 of whom are scientists and engineers. He said MCC's research programs in four areas — semiconductor packaging, software technology, computer-aided design and advanced computer architecture — are expected to yield significant results in five to 10 years.

The computer architecture program is a 10-year effort that includes projects in parallel processing, data base system management, artificial intelligence and human factors technology.

CDC reports 40% decline

MINNEAPOLIS — Control Data Corp. recently reported a 40% decline in second-quarter profits.

The company's second-quarter profits were $23.4 million, or 60 cents per share, compared with $38 million, or $1.01 per share, a year earlier. Revenues rose 10% to $1.26 billion from $1.14 billion.

CDC attributed the decline in profits to difficulties in the data services division, which provides time-sharing and data processing services. The company said the worldwide changeover from time-sharing services to micros has affected profit.

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AT&T to tailor Unix System V for desktop micro operation

By Eric Bender
CW Staff

LAS VEGAS — Over the next 18 months, AT&T will release Unix System V enhancements that will tailor the operating system to requirements of desktop microcomputers, according to Jack Scanlon, vice-president for computer systems at AT&T Technologies.

The enhancements will address both the need to run in limited memory space and demand for a friendlier user interface, Scanlon said here recently during the National Computer Conference.

"The limitations of Unix for micros are well-known, but they're not fundamental to the operating system," Scanlon said. "They're omissions, not deficiencies."

While other operating systems may already overcome those limitations on microcomputers, they lack the scope of Unix System V, which can run on machines from desktop systems to mainframes, Scanlon maintained.

The upgrades, which will be disclosed in a series of announcements "earlier rather than later" in the 18-month period, "will patch up some of the gaps Unix has at the low end," according to Scanlon. File locking and record locking are among the planned enhancements, he said.

Another goal is an easy-to-use interface for the multitasking environment, which would include a standard applications manager, windowing, icons, mouse, voice and data communications facilities and other features as appropriate, Scanlon said.

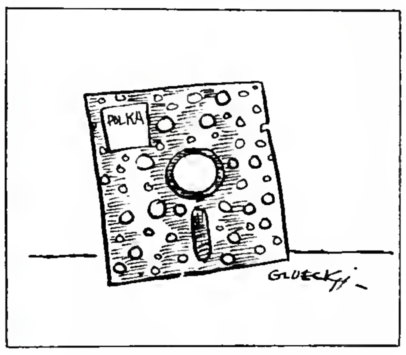
Multitasking fundamental

He called multitasking fundamental to desktop computing, noted that the user can be viewed as "another multitasking processor" and pointed out a need for a "more seamless environment" linking man and machine.

One approach to memory demand is to unbundle System V, including only the portions of the operating system necessary for a given use, Scanlon said. "We've already done that with the [AT&T] 3B2" supermicrocomputer, he said. Scanlon also remarked that decreasing prices for random-access memory chips are minimizing the problem, as the standard configuration for a desktop business microcomputer is beginning to exceed 256K bytes.

Discussing AT&T's own hardware offerings, Scanlon acknowledged that the company received some criticism last month for introducing a personal computer running Microsoft Corp.'s MS-DOS rather than Unix. That decision "simply reflects today's realities," with many times more application packages running under MS-DOS than under System V, Scanlon said.

Larry Dooling, executive director for workstations and small business systems at AT&T Information Systems, commented that Unix's advantages are strongest in multiuser configurations.



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Conventional data retrieval methods force you to accept a number of unproductive trade-offs in place of real efficiency. For example:

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With conventional methods, individual records within a file can only be located by unique, pre-established keys. The more specific your information request, the more keys you have to use and the greater your storage overhead becomes.

The Content Address Method has its own unique way of identifying and locating data. So your information request can be as specific as you wish, without driving up overhead to the usual levels.

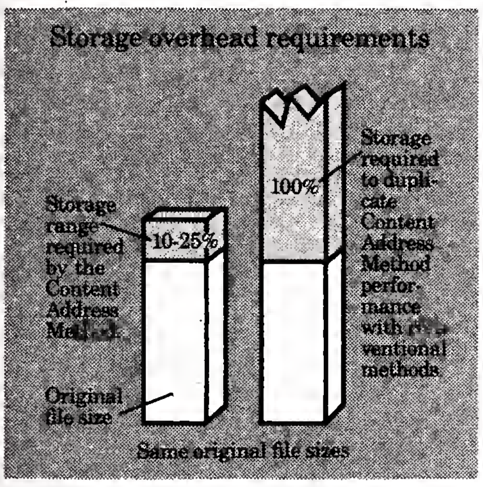
Locating an individual record with conventional methods requires sequential searching through a file, if it is not a keyed field search. The cost in wasted effort and CPU access time can be prohibitive.

The Content Address Method can immediately and directly locate a record, or even a word within a field with equal ease and minimal impact on your direct access storage costs. Required storage for the Content Address Method is usually less than 15% of the file size and almost never more than 25%.

How the Content Address Method works.

The Content Address Method is a technique that establishes its own path to stored information, without altering its present structure, order or location. This means that you can take advantage of this new technology without ever changing your existing organization of data. And because this method ignores the structure of data and depends only on the actual content of a record, there is never any need to reorganize files to fit new applications.

Under the Content Address Method, stored data is analyzed and indexed once, automatically. Each field, with its substrings, is assigned a mathematical value, based on content, to identify the information it contains. Since these record identifiers or "keys" are related numerical values instead of character strings, the storage space required to index your data is almost never more than 25% of the original file size. More often, it's less than 15%.



Conventional access methods require you to devote storage space to indexing record keys. Keying individual fields can use twice as much storage as the file itself. The Content Address Method almost never requires more storage than 25% of the original file size. Most often, required storage is less than 15%.

It doesn't fit the usual definitions.

The Content Address Method is not an access method in the usual sense, but it does make it easier to identify and retrieve data. It isn't a data management system, but it offers the same power and advantages. The Content Address Method requires no costly and time-consuming conversion, so you won't have to tie up your data center or risk lengthy backlogs. It simplifies data base administration by eliminating the need to store data according to how it will be retrieved. It cuts search time, no matter how complex the search criteria. In fact, the more detailed the criteria, the faster the search can be completed.

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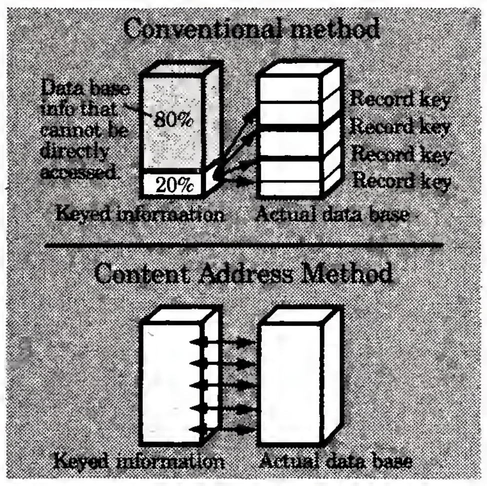
So even though you can't own the technology behind the Content Address Method, you can enjoy the benefits it offers every time you use software from On-Line Software International.



With conventional methods, you can usually afford direct access to only about 20% of your data base. However, the Content Address Method provides direct access to every field and its sub-strings, and does it cost effectively.

A summary of the benefits of the Content Address Method.

- Identifies and locates data based on content, not sequence or key names.
- Ensures that the records you read are only those that contain the information you want.
- Permits flexible application coding.
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Cmos integrated circuit demand spurs host of start-ups

OUTSIDE LINES

Bohdan Szuprowicz

In the booming semiconductor industry, no sector can outpace the production of Cmos integrated circuits, labeled the semiconductor workhorse of the future.

There are several ways to manufacture integrated circuits, and each technology offers various advantages and disadvantages. There are three types of the so-called bipolar semiconductors, which are the fastest and the most widely used devices, but which require a constant supply of power to operate.

MOS results from a simpler and cheaper manufacturing technology that produces microchips requiring less power than bipolar devices. Cmos technology, one of three basic MOS technologies, produces microchips with the least power consumption requirements.

This is becoming a critical factor in the use of integrated circuits, which are becoming denser and more complex every day, thanks to the availability of powerful computer-aided engineering workstations with which very large-scale integration (VLSI) circuit microchips can now be designed with relative ease. But use of such powerful VLSI integrated circuits leads to overheating and the need for extensive cooling systems that are costly, cumbersome and completely impractical for portable and battery-operated computers and other electronic devices.

As a result, Cmos microchips for memory and logic applications are rapidly gaining in popularity. The market for Cmos is expected to be almost $1.5 billion in 1984 and will probably double by 1986, according to a forecast by the Semiconductor Industry Association. Some forecasters suggest that by the end of the 1980s, from 30% to 50% of all integrated circuits in use will be of the Cmos variety.

Because of the booming demand for integrated circuits since 1983, shortages in supply and a flood of venture capital, a number of new start-ups have appeared on the scene hoping to cash in on this exploding market.

integrated circuit plant has risen to the $70 million to $100 million range, those new start-ups will need a lot of new financing to stay in the game; or they will be acquired rapidly by one of the major electronics manufacturers for captive in-house operations. The new entrepreneurs are gambling on the fact that whichever way the chips may fall for them, they are bound to make out in the end.

Altera Semiconductor is a 1983 start-up gearing up to manufacture electrically programmable Cmos logic devices; it has already received $10 million through two rounds of financing. Its investors are an impressive group of professional venture capital firms, including Allstate Insurance Co., Alpha Partners, Cable Howse & Cozadd, F. Eberstadt, Technology Venture Associates, Welsh Carson Anderson & Stowe and Venture Growth Associates.

Cypress Semiconductor appears to be one of the best financed Cmos microchip manufacturers, with almost $32 million in venture capital, and is involved in the production of very high-speed semiconductor memories. The company is backed by an array of top high-technology venture capital firms.

Exel Microelectronics, Inc. is a manufacturer of nonvolatile erasable programmable read-only memory (Eprom) Cmos memory devices that was spun out from another Eprom start-up, Seeq, in 1983 and also received up to $40 million in three rounds of financing from leading venture capitalists. Along with Cypress Semiconductor, Exel appears to be nearing a stage when it should be going public in the not-too-distant future.

Integrated Device Technology is among the new Cmos start-ups that did go public last March. The company's revenues are expected to triple in 1984 to $30 million, and it is among the fastest growing integrated circuit manufacturers. International Microelectronic Products is in the hot area of semicustom standard cell Cmos microchips production and is also expected to triple its revenues in 1984.

Lattice Semiconductor, Inc. is constructing a new Cmos fabrication plant that will process large-size 6-in. silicon wafers using the latest semiconductor manufacturing equipment to produce ultra high-speed integrated circuits.

LSI Logic, which was among the first Cmos custom gate array producers to go public in early 1983, is expected to continue its rapid growth to reach $100 million in sales for 1984 and is regarded as one of the strongest performers of the new breed of Cmos producers.

At least 15 other new companies are also playing the field, but relatively little information is available about most of them to date.

Bohdan O. Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

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Gould names IBM's McDonald as chief, Simpson as vice-chairman

ROLLING MEADOWS, Ill. — Gould, Inc. recently named James F. McDonald, formerly an executive with IBM, as its president and chief executive officer.

McDonald most recently was general manager of IBM's manufacturing systems products business unit in Boca Raton, Fla. He held a number of executive posts during 21 years working at IBM.

William T. Ylvisaker, Gould's chairman and chief executive, said McDonald's appointment came at a significant time for the company, which has transformed itself from a diversified industrial products firm to an electronics company.

"McDonald's experience is ideally suited to our long-term requirements," Ylvisaker said in a prepared statement.

Diverse background

Ylvisaker added that McDonald "brings to Gould a diverse and well-disciplined background in managing electronics businesses."

McDonald will succeed David Simpson, who has been appointed vice-chairman of Gould's board of directors. Simpson will retain his responsibility for international marketing and research and development, the company said.

McDonald's experience at IBM ranged from directing the design and development of computer systems to research, manufacturing and marketing.

As general manager with the manufacturing systems products business unit, he was responsible for the development, manufacturing and marketing of industrial robots, sensors and controllers, which are utilized to drive flexible manufacturing cells.

Gould inks license pact with China

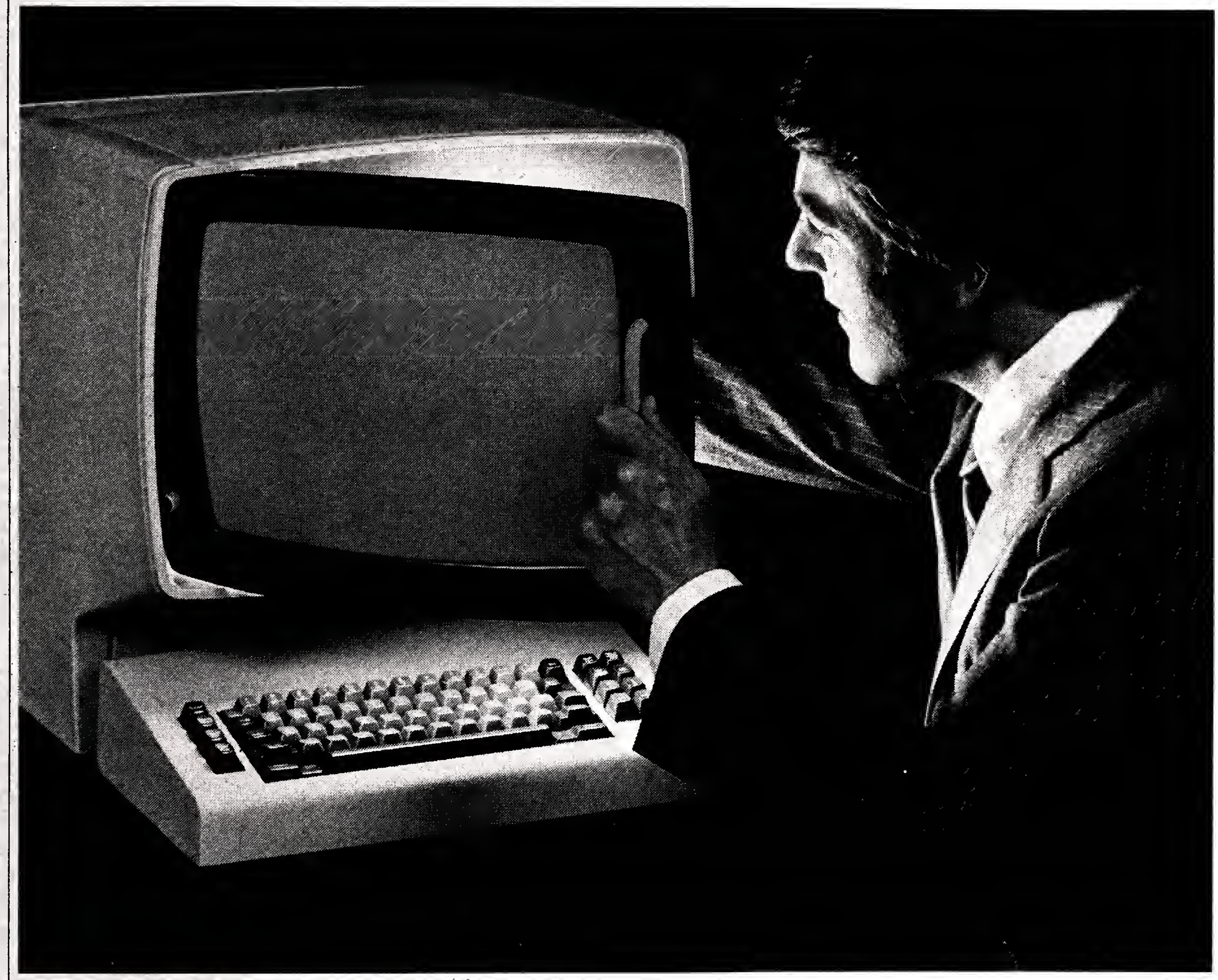
ROLLING MEADOWS, Ill. — China will be manufacturing a component of Gould, Inc. computers on Chinese soil under a 10-year licensing agreement recently announced by Gould.

The agreement allows the China National Machinery and Equipment Import and Export Corp. of Beijing to oversee, manufacture and assemble programmable controllers for Gould. The controllers will be produced at the Tianjin Automation Instrumentation Factory in Tianjin, China, according to David Simpson, president and chief operating officer of Gould. The controllers will be sold in the Chinese industrial markets for factory automation applications.

Valued at a minimum of $12 million over the first three years, the agreement also calls for a service and training center to be established. Gould will provide technical training that will include instruction in manufacturing techniques for assembly, testing, quality control and maintenance. The company will also conduct classes on the application of programmable controllers and their peripheral devices.

Both parties are said to be considering further cooperation, including the establishment of a joint venture in an area of Gould's electronics business. Simpson said, "This is one of several agreements we have begun to pursue in the People's Republic of China, and it represents the opportunity to further expand our international business boundaries." Simpson added that Gould expects to open a corporate office in Beijing at the end of the third quarter of this year.

Models of programmable controllers designated in the contract include the Gould Micro-84 with its P370 programmer, the P371 program pack and 300 series I/O modules, and the larger Gould 584 controller and 200 series I/O modules.



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Cullinet to distribute in China

WESTWOOD, Mass. — Cullinet Software, Inc. recently announced an agreement that it said will make it the first company to have distribution rights in the People's Republic of China.

Other companies such as Digital Equipment Corp. and IBM sell hardware and software in China, but Cullinet said it will be the first company to sell software only.

The company reached an agreement with the China Computer Technical Services Corp. (CCTSC) of the Chinese Ministry of Electronics. The deal provides for CCTSC to act as an exclusive licensing, service and support organization for Cullinet software in China. The agreement is subject to approval by both the U.S. and Chinese governments.

Expanding market

While there are only about 50 IBM mainframes in use in China, the market is rapidly expanding, a Cullinet spokesman said.

Virtually none of China's existing mainframes use a data base management system (DBMS).

Cullinet expects the bulk of its early sales in China to come from its flagship IDMS/R DBMS. However, the company will sell its full range of systems and application software to the new market.

Cullinet is located at 400 Blue Hill Drive, Westwood, Mass. 02090.

Prime reports revenue, profits up

NATICK, Mass. — Prime Computer, Inc. last week reported that second-quarter revenues climbed 32% over the year-earlier period, and profits more than doubled. The company also said the recently enacted 1984 Tax Reform Act could add another $9 million in profits for the first six months of the current fiscal year.

For the quarter ended July 1, Prime posted revenues of $161.3 million, compared with $121.9 million for the year-earlier period. Profits for the quarter were $12.8 million, or 48 cents per share, more than double the $6.3 million, or 31 cents per share, reported a year earlier.

Joe M. Henson, president of Prime, said the company achieved its greatest sequential quarterly product revenue growth since the fourth quarter of 1980. "The improved profitability reflects strong sales volume, a product mix shift toward larger, higher margined products and the company's substantial operating leverage," Henson said.

The recent Tax Reform Act eliminated tax on the company's Domestic International Sales Corp., and subject to accounting treatment guidelines to be issued by the Financial Accounting Standards Board, it expects to recognize $9 million in profits in addition to the $23 million in profits already reported for the first six months of the fiscal year.

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FUJITSU

HP exec selection spurs talk of internal discontent

By Jeffry Beeler
CW West Coast Bureau

PALO ALTO, Calif. — Contrary to widespread speculation, Hewlett-Packard Co.'s selection of Dean Morton as its new chief operating officer in no way reflects any internal dissatisfaction with the firm's computer business, according to HP spokesman Roy Verley.

"Reports that we're unhappy with what's going on in the computer side of our business don't make much sense to us," Verley said during a recent interview. "Revenues from our computer sales are quite a bit more than 30% higher than what they were a year ago."

Moreover, HP recently promoted Cyril Yansouni, head of the company's personal computer operations, from general manager to vice-president. "That action is a statement that we're pretty pleased with the way our personal computer products are going right now," he said.

Yet despite apparent signs to the contrary, rumors that HP's computer sales have fallen short of the vendor's expectations persist. Much of the speculation apparently stems from the firm's recent decision to name Dean Morton rather than Paul Ely as its chief operating officer.

Morton's promotion coincided with a sweeping reorganization of both HP's computer and instruments operations and stunned many industry analysts, who had expected Ely to get the nod instead. Prior to the corporate shake-up, Ely was executive vice-president in charge of HP's Computers Group, while Morton held an equivalent position as head of the firm's Medical, Analytical and Components groups.

To company insiders, however, HP's preference for Morton over Ely reportedly came as no great surprise. Since 1983, Morton has headed HP's Management Council, a policy-setting group that put him just one rung below President John Young in the corporation's executive hierarchy, Verley said.

HP's latest reorganization also resulted in a job change for Ely, who now replaces Morton as executive vice-president in charge of the firm's Medical, Analytical and Components groups. At least a few industry observers have interpreted Ely's departure from the corporation's Computers Group as a subtle demotion and as further evidence of internal discontent with the company's personal computer sales.

Verley, however, disputed the demotion theory. "I think Paul feels that his new position is the place where he can now make the greatest contribution to the company," Verley said.

Ely now has ultimate responsibility for HP Laboratories, which under the reorganization will play an expanded role in the firm's long-term product strategy.

Amdahl's second-quarter profits down

SUNNYVALE, Calif. — Amdahl Corp., citing problems in the company's international operations, said recently that its second-quarter profit dropped 80% below the operating net income of the same quarter for the previous year.

The company reported that profit declined to $4.9 million, or 11 cents a share, from $8.8 million, or 20 cents a share, before extraordinary credit, for the year-earlier period.

The company reported a 1983 extraordinary tax credit of $800,000.

Increase of 8%

Revenue rose to $196.8 million, compared with $180.8 million a year ago, an increase of 8%.

According to John C. Lewis, Amdahl president, the quarterly drop in profit had been expected.

He said that the drop "reflects a continuation of unfavorable foreign currency exchange rates and lower than planned product volume in some of our international markets."

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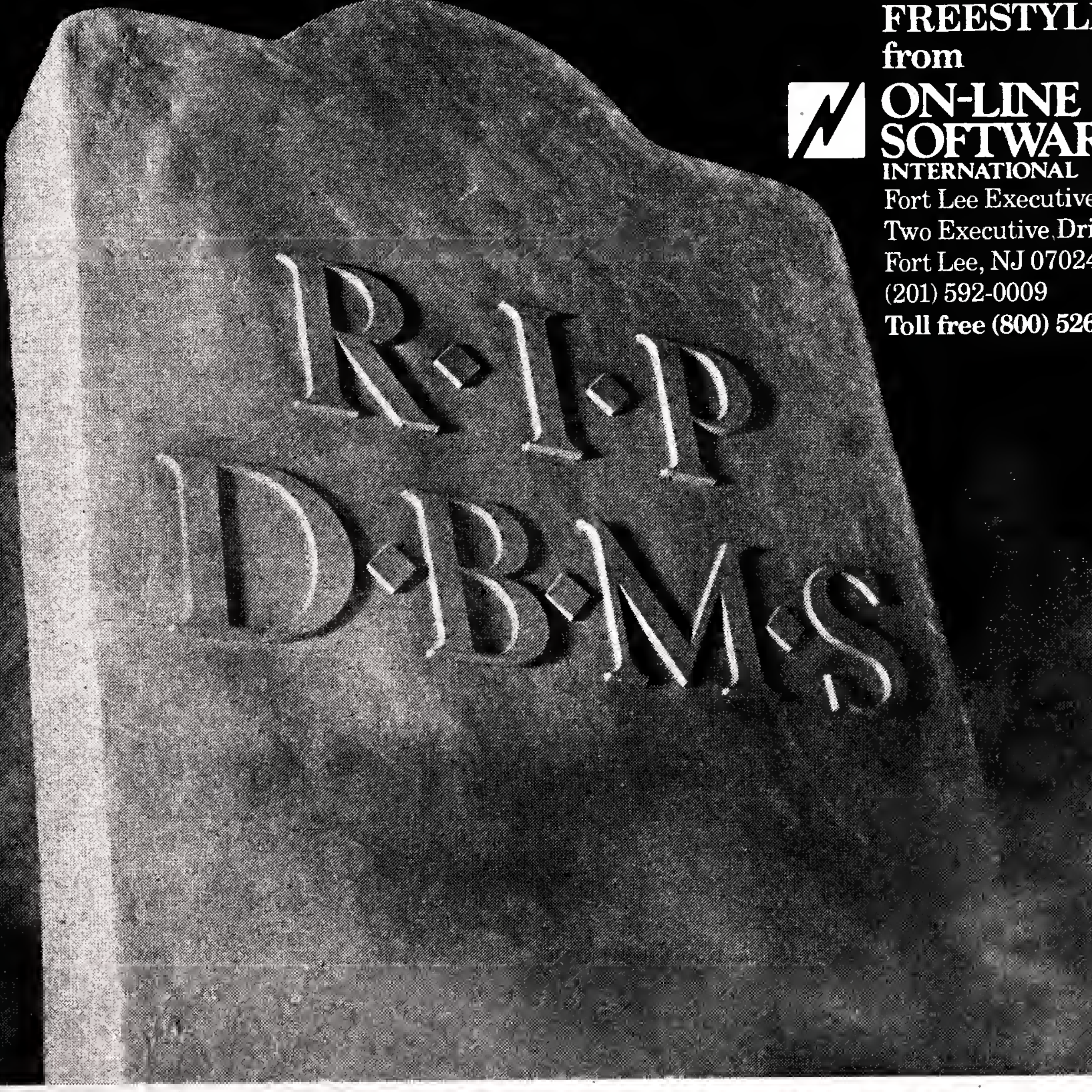

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MCI chairman calls for FCC slowdown of AT&T deregulation

WASHINGTON, D.C. — AT&T "is still trying to pull the wool over everybody's eyes," the chairman of MCI Communications Corp. said here recently.

William C. McGowan, speaking at the company's recent annual meeting, accused MCI's chief competitor of using "new math" to make its share of the interstate communications market appear less than it actually is.

The purpose, McGowan said, is to persuade the Federal Communications Commission to deregulate AT&T sooner.

He contended that the commission should not deregulate AT&T until AT&T's competitors can interconnect with local exchange networks across the country.

Charleston, W. Va., this month became the first city in the U.S. to offer equal access, but the process is not scheduled to be completed nationwide until 1986.

Intrastate communications

McGowan added that the intrastate communications market will become increasingly important in the coming year. "We will not have full competition until we have competition within the states," he said. Another goal is to make access charges for intrastate services compatible with those the FCC has established for interstate services.

MCI's sales for its latest fiscal year, ending March 31, rose compared to the previous year, but the percentage growth was far less than it has been previously. The most dramatic reflection of this change was that net income for the first quarter of the present year, ended June 30, totaled $33 million, down 40% from the same period a year earlier.

MCI President V. Orville Wright said the decline was due largely to higher access charges mandated by the FCC and to massive investment in new network facilities.

Regarding the latter, he said that at the end of fiscal 1984, MCI had a total of 142 operating terminals, 32 more than a year earlier; 129 switching systems, a 25% increase during the year; and 155 million circuit miles of transmission capacity, an increase of 37%.

MERGERS AND ACQUISITIONS

Interactive Research Corp., Santa Clara, Calif., has been acquired by **Evergreen Technology Corp.**, a Canadian firm.

■

Gerber Scientific, Inc., South Windsor, Conn., announced that its wholly owned subsidiary, **Gerber Scientific Instrument Co.**, has completed its acquisiiton of **American Hoechst Corp.'s Eocom** electronic systems division in Tustin, Calif., for $6 million. Eocom designs, manufactures, markets and services laser-based imaging devices used in reprographics.

■

Zitel Corp., San Jose, Calif., announced it has agreed in principle to acquire **Gifford Computer Systems, Inc.** in San Leandro, Calif., a privately held company, for 250,000 shares of Zitel stock.

■

MacNeal-Schwendler Corp. (MSC), Los Angeles, announced that it has reached an agreement to acquire **Modular Data Systems, Inc.** (MDSI), a Houston-based developer of computer software used in the real-time control of continuous-flow industrial processes. The agreement, which has been approved by both boards, calls for a two-stage acquisition in which MSC will acquire MDSI stock for a combination of cash and MSC stock.

MSC will purchase 35% of outstanding MDSI stock, effective July 1, and will acquire the remaining 65% on July 1, 1987, if certain corporate performance objectives are met by MDSI.

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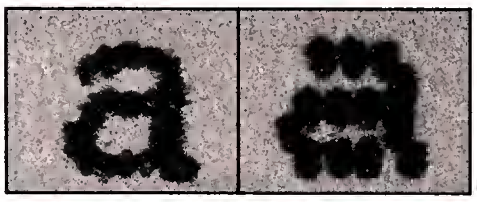

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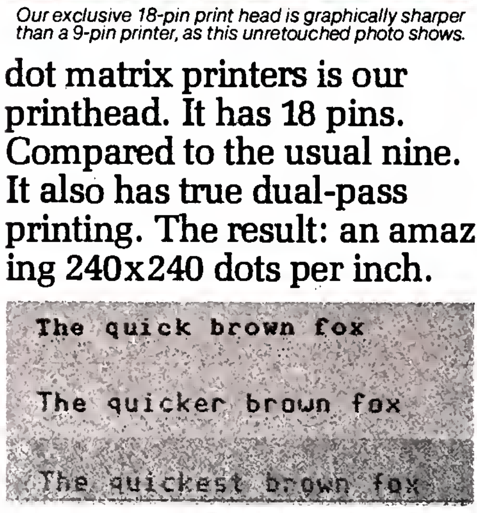

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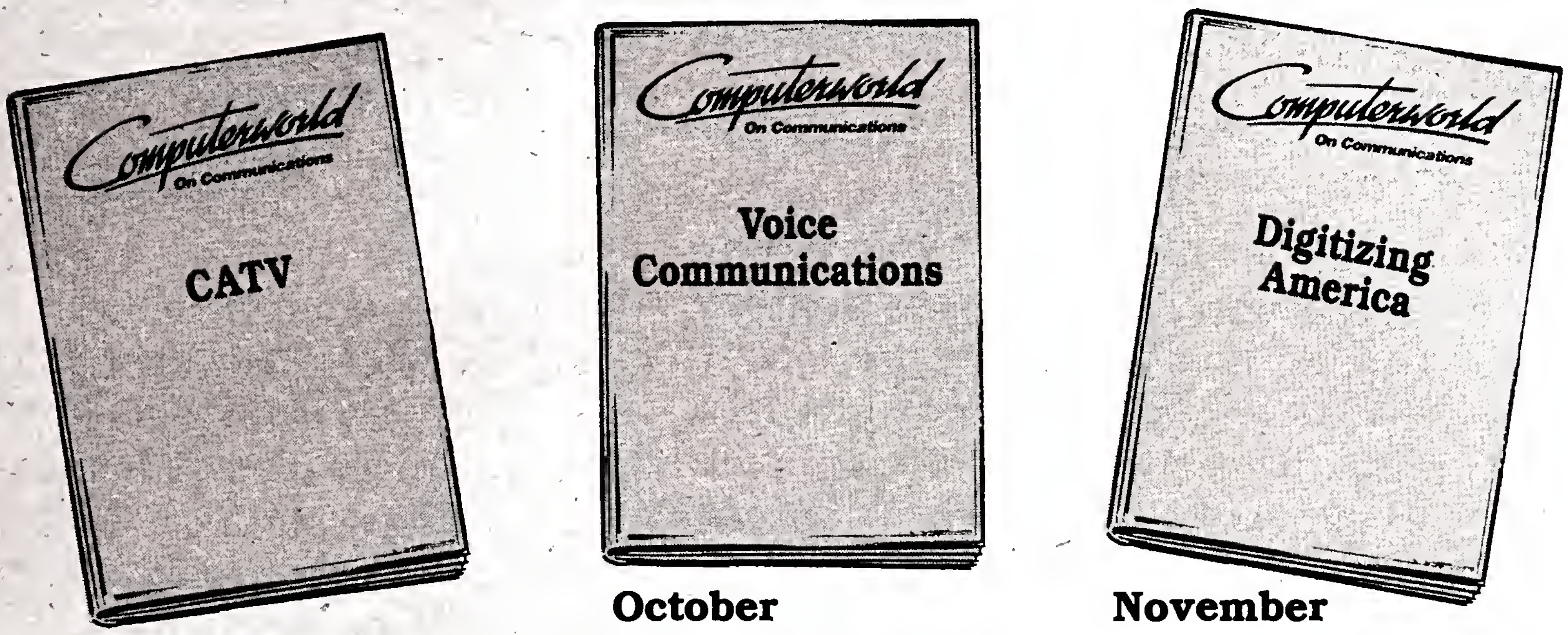
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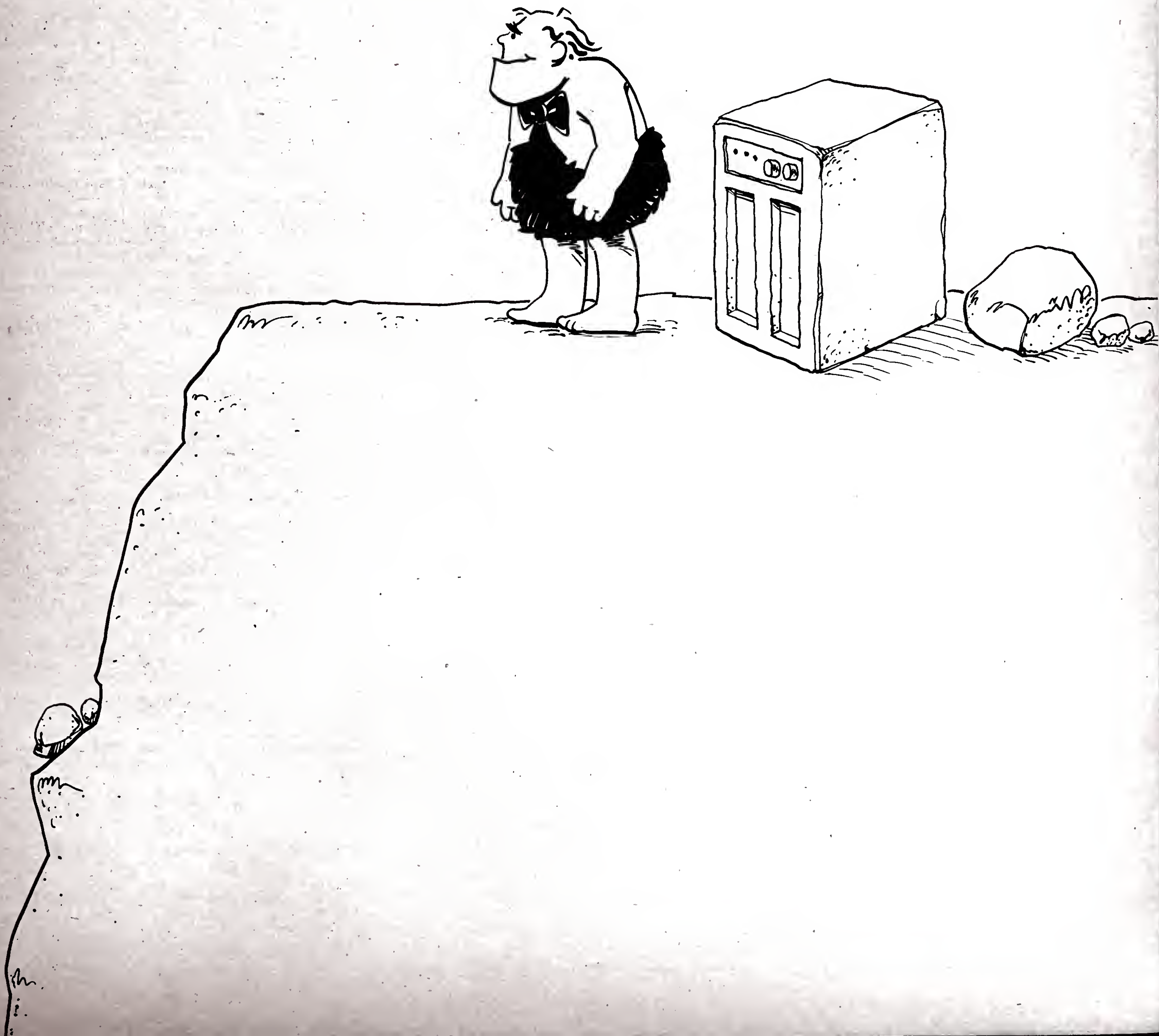

Iges to have one-year test

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — An extension of the popular Initial Graphics Exchange Standard (Iges) to encompass solid geometric representations of objects will be tested for one year, according to the National Bureau of Standards (NBS).

The Experimental Solids Proposal (ESP) test will be carried out with the cooperation of four corporations working with two federal agencies. The aim of the one-year test is to modify and improve solid geometric models for inclusion in the Iges standard, NBS said.

NBS said it is working cooperatively on the test project with Bendix Corp., Ford Motor Co., General Electric Automation Systems Laboratory, Structural Dynamics Research Corp. and the National Aeronautics and Space Administration.

The benefit of the work being performed is aimed primarily at users of computer-aided design and manufacturing (CAD/CAM) systems, NBS said.

"The ESP program will provide the [graphics exchange standard] with a part geometry definition, which is essential for the advanced intelligent industrial automation systems that are being developed," commented Bradford Smith, coordinator of the project for NBS.

Peter Downey, vice-president of technology for the CAM-I Geometric Modeling Project, called the ESP extension of the graphics exchange standard "a major step in the industrial advancement of the product definition technology which will be the foundation for a new generation of design and manufacturing automation."

The standard provides a carefully defined language format for the exchange of computer data representing three-dimensional and two-dimensional drawing information between dissimilar CAD/CAM systems. It was introduced in 1979 and has been periodically upgraded.

The ESP program will permit workstations to depict designs as solids rather than merely as wires connecting to points, as most CAD/CAM systems are currently configured.

Rolm reports 31% revenue gain, $2.2 million profit hike for 1984

SANTA CLARA, Calif. — Rolm Corp. last week reported revenues for fiscal year 1984 were $659.7 million, up 31% from 1983, when revenues were $502.6 million. For the fourth quarter ended June 29, the company reported revenues were $196 million, a 43% increase over the comparable quarter a year earlier.

The company reported profits for the fiscal year of $37.7 million, compared with $35.5 million in the previous year. But earnings per share declined to $1.49 in 1984 from $1.80 in 1983, based on an increase of 5.6 million shares outstanding in 1984.

For the fourth quarter, profits were $11.7 million, or 50 cents per share, compared with year-earlier profits of $9.6 million, or 42 cents per share.

M. Kenneth Oshman, president of Rolm, said the company would continue to invest in the competitive business communications markets, "while at the same time focusing on improvement in the profitability of our business."

NICKELS AND DIMES

Avant-Garde Computing, Inc. reported revenues for the fourth quarter ended April 30 more than doubled to $4.9 million from $2.4 million for the same quarter one year ago. Profits more than tripled to $527,000, or 16 cents per share, compared with $141,000, or 3 cents per share, for the same period last year.

For fiscal 1984, revenues more than doubled to $15.3 million, compared with $7.2 million in fiscal 1983. Profits were $1.4 million, or 45 cents per share, compared with $578,000, or 13 cents per share, the previous year.

■

American Software, Inc. reported revenues for the fiscal year ended April 30 of $21 million, compared with $16 million a year earlier. Profits were $4.2 million, or $1 per share, compared with $3.3 million, or 92 cents per share, one year earlier.

Fourth-quarter profits were $961,000, or 23 cents per share, compared with $723,000, or 18 cents per share, one year ago. Revenues were $5.6 million, compared with $3.7 million from the previous year.

■

BGS Systems, Inc. reported profits for the first quarter ended April 30 of $142,930, or 5 cents per share. Revenues were $701,658, compared with $2.2 million one year earlier.

■

Alpha Microsystems, Inc. announced revenues of $13.5 million, compared with $10.4 million in the comparable period one year earlier. Profits were $983,000, or 30 cents per share, compared with $777,000, or 28 cents per share, one year earlier.

■

Intermetrics, Inc. reported revenues for its first quarter ended May 31 of $10.5 million, compared with $7.9 million one year ago. Profits were $119,000, or 4 cents per share, compared with $41,000, or 1 cent per share, one year earlier.

■

Ashton-Tate announced revenues for the quarter ended April 30 of $11.2 million, down from $13.5 million in the previous quarter. Profits were $149,000, or 2 cents per share, down from $1.7 million, or 20 cents per share.

■

CSP, Inc. announced revenues for the quarter ended May 31 decreased by 11% as compared with the same quarter of fiscal 1983. The net income for the quarter was $140,000, which includes net dividend and interest income of $120,000 and a tax benefit of $75,000 from the reduction in the estimated income taxes.

■

Onyx-Imi, Inc. announced revenues for the twelve weeks ended June 10 of $26.1 million, compared with $16.9 million in the comparable period a year earlier. Profits were $1.015 million, or 10 cents per share, compared with $1.014 million, or 10 cents per share, in the comparable period one year earlier.

■

CGA Computer, Inc. reported revenues for the fiscal year ending April 30 of $46.3 million, compared with $33.1 million last year. Profits were $3.4 million, or 97 cents per share.

■

Pansophic Systems, Inc. reported revenues and profits for its fourth quarter and fiscal year ended April 30. Revenues increased to $53.1 million, up 23% from last year. Profits for the year were $8.3 million, or $1.01 per share, compared with $5.7 million, or 80 cents per share, one year earlier. Fourth-quarter revenues were $14.9 million, compared with $11.7 million last year.

■

Rand Information Systems, Inc. announced profits for the fiscal year ended Feb. 26 of $109,900, or 4 cents per share, compared with $234,300, or 9 cents per share, in the same period last year. Revenues were $12.6 million, compared with $14.1 million one year earlier.

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UK

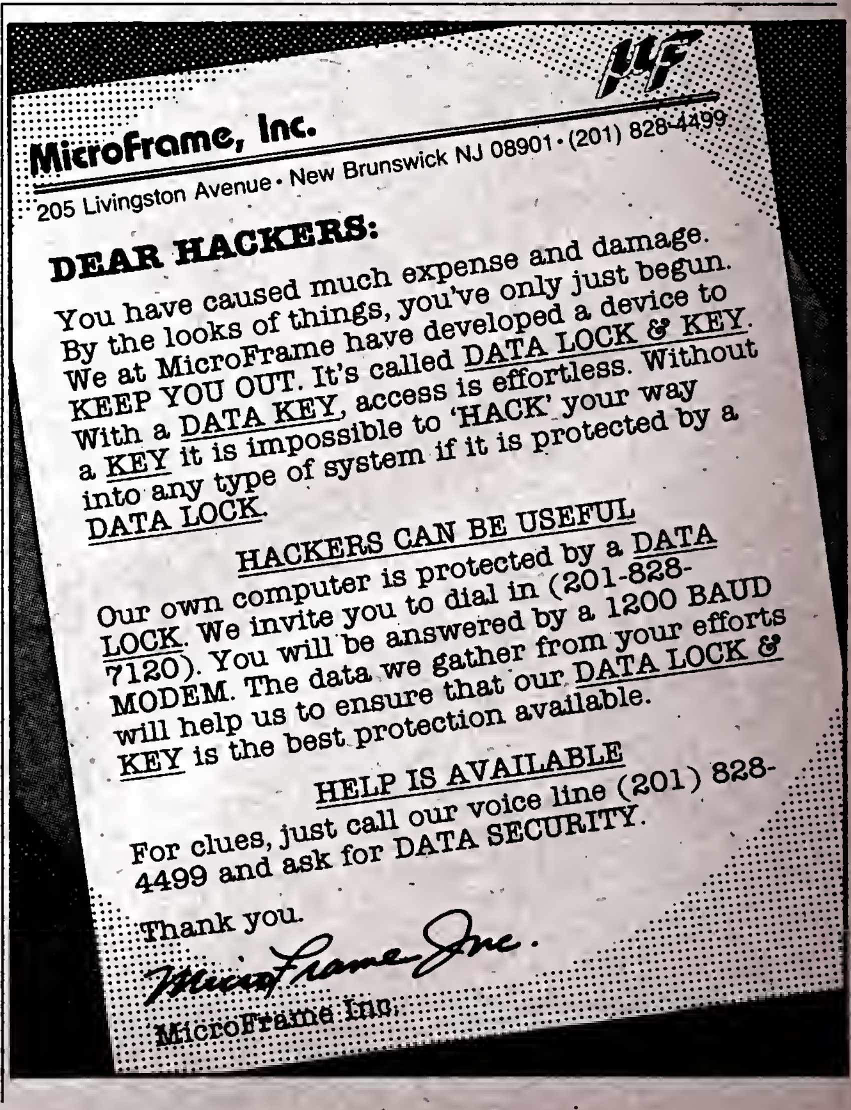
from page 71

pants that the British government bureaucracy — the Civil Service — is not controlled by elected government and that it controls the dissemination of information with the intent of furthering its own contentment.

Strauss' computeracy would: "Use the new technology of knowledge engineering from the start," he said.

"It will incorporate into its structure, functions and organization the latest thinking and expertise on artificial intelligence, expert systems building and analysis, model building and intelligent data bases, which can learn and hold an effective consultation with a home computer user who dials in," he added.

Preventing the establishment of yet another bureaucracy would be accomplished by limiting to three years the amount of time any one person could spend employed in this new endeavor, Strauss said.



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COMPUTERWORLD
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MINIS AND SMALL BUSINESS SYSTEMS
SPECIAL REPORT

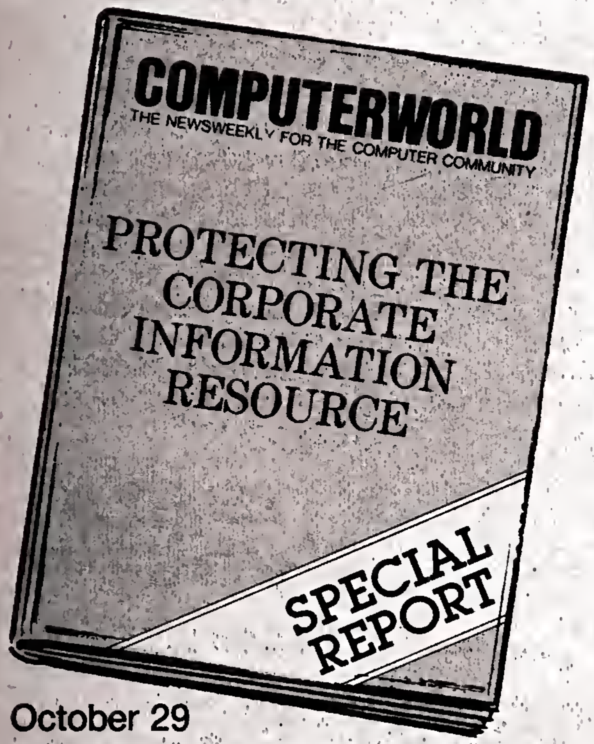
August 27

Minis and small business systems
We'll take a close look at the growing number of applications available. Plus we'll include reports from users on the problems they've had in selecting and implementing these systems, and how they solved them. Also, we'll offer vendors' suggestions on how to increase the efficiency and cost-effectiveness of minis and small business systems.
Closes August 10

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
DATA BASE MANAGEMENT SYSTEMS
SPECIAL REPORT

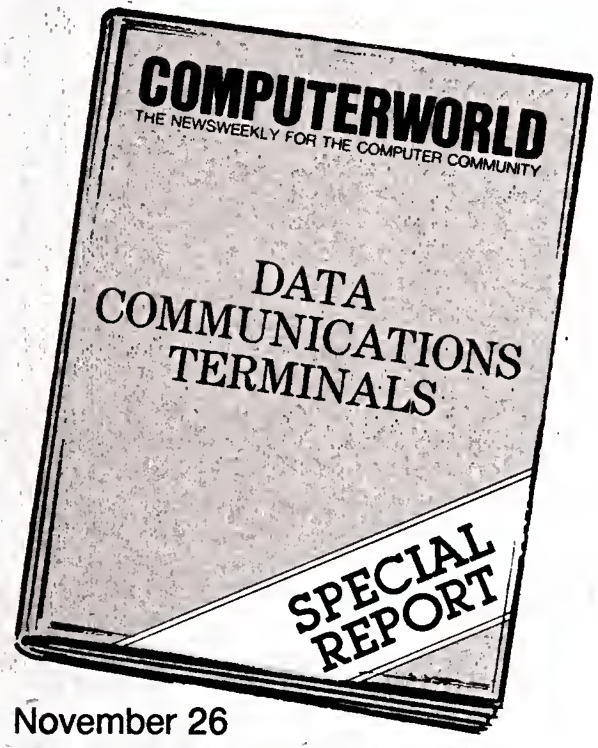
September 24

Data Base Management Systems
A comprehensive report geared toward a realistic understanding of DBMS. We'll include articles from users and industry experts on how to evaluate, select, implement, and trouble-shoot DBMS. And we'll update readers on recent developments, as well as offer users' solutions to common and not-so-common DBMS problems.
Closes September 7


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
PROTECTING THE CORPORATE INFORMATION RESOURCE
SPECIAL REPORT

October 29

Protecting the Corporate Information Resource
We'll discuss how to protect hardware & software resources, people resources, and physical plants. There'll be articles on: uninterruptible power supplies, data security monitors, data encryption software, disaster recovery centers (offsite data storage), fault-tolerant processing, data transmission security, protecting the computer room, and contingency planning.
Closes October 12


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
DATA COMMUNICATIONS TERMINALS
SPECIAL REPORT

November 26

Data Communications Terminals
Users and vendors will comment on how terminals are making computers more responsive to organizational needs. Topics include: how to get the most out of dumb terminals; an update on smart and intelligent terminals; and guidelines for determining terminal's needs and selecting the equipment to meet them.
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Experience on assignments requiring use and application of standard data processing/programming principles and techniques with background on IBM mainframes running under the MVS-JES3 operating environment. This includes the utilization of the IMS Database and Data Communication System, the use of TSO for application development, the use of PL-1/COBOL and familiarity with MARK IV and SAS is desirable. Responsibilities include the definition, design, code, testing and documentation of programs and systems. Sr. level assignments are usually large projects or systems design where the approach is new and must be determined, and involves project leadership. A minimum of two years experience is required, with senior level positions requiring five to eight plus years of experience.

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DATA PROCESSING

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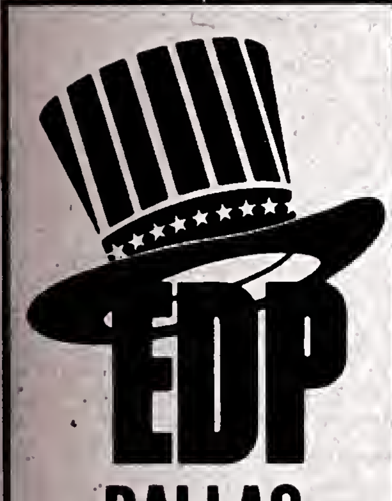

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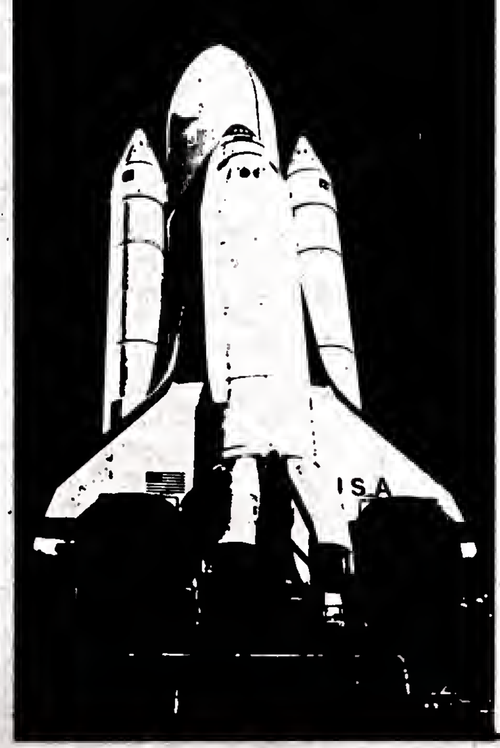

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  Bachelor's or advanced degree in Computer Science, Business Administration, or equivalent, with at least 4 years experience in software engineering. Position requires direct experience in large scale IBM/Computer Systems utilizing COBOL and Business Systems Applications. Experience with IMS DB/DC desirable. Inventory management, purchasing and accounting applications highly desirable. Duties to include system definition/design, coding, testing, implementation and training the user.

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Please forward your resume to: **Ford Aerospace, Dept. A762, P.O. Box 58487, Houston, TX 77258. Send your inquiry to the direct attention of Marie Davenport, Recruiter for positions in Advanced Systems Engineering and Test Engineering, and to Diane Roberts, Recruiter for positions in Software Systems.**

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Candidates must have several years experience with large data base projects, have a thorough knowledge of system hardware and software and have good organizational and communication capabilities. Preference will be given to candidates with library automation experience and a graduate degree from an American Library Association accredited library school.

The University of Iowa is a major research university. Its library system ranks 26th in volume holding among U.S. academic/research libraries. The University is a leader in innovative use of information technology with an emphasis on a community-wide information network. Iowa City is noted for a pleasant life style, an excellent education system and a full range of cultural and athletic activities.

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The position is to be filled as soon as possible. Screening of candidates will begin August 20; 1984.

Interested candidates should submit a letter of application, with a resume and at least three reference names to: **James Johnson, Director, Office of Information Technology, 101 Jessup Hall, University of Iowa, Iowa City, IA 52242.**

Additional Information can be requested from the above address or by calling **(319) 353-4699.**

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AMERICAN DIVERSIFIED Information Systems Division currently operates a 300-user network on VAX 11/780 equipment. We need highly motivated professionals to help expand our VAX cluster to a network serving over 700 users nationwide by 1985. Our unique data center, in a premiere Southern California setting, makes use of state-of-the-art hardware database processors and the latest cluster and ETHERNET technologies. We currently have the following needs:

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This position requires a skilled manager with VAX experience who will supervise a dynamic systems programming team, with technical responsibility for an expanding national network which will eventually include 7 large systems and 1,200 terminals. Duties include planning and monitoring systems projects and performance, maintenance of computer security, and involvement in hardware and system software selection/implementation. BA degree and min. 5 years' experience. Specify Job #CCorp 57

SYSTEMS ENGINEER

A background which includes involvement with VAX hardware is essential for this individual, who will create and maintain system software, utility programs and application subroutine libraries. Additional responsibilities will include performance of database design, monitoring overall system performance and providing assistance to the applications programming staff. A thorough understanding of the computer internals is required, and 5 years' programming experience. Specify Job #CCorp 59

PROGRAMMER/ANALYST

We need an individual with 2-3 years' programming experience, who has worked 1 year with a VAX system as either a programmer or programmer analyst. Primary responsibilities will include performance of detail computer program design, coding, testing, debugging, documentation & implementation of a number of commercial applications. BS required. Specify Job #CCorp 75

SUPERVISOR, VAX COMPUTER OPERATIONS

Will supervise personnel and oversee operations of hardware equipment. Will maintain log control and provide status reports for action items received from various departments. Requires DCL command language and VAX computer operations experience including shutdown, start-up system and users' maintenance. 5 years' DP experience, 3 years' supervisor in computer operations. Specify Job #CCorp 76

NETWORK TECHNICIAN

Knowledge in both basic electronics and data communications test equipment is required for this position, which will be responsible for testing, configuring and troubleshooting data communications equipment, and problem-solving for our user hotline. There is the opportunity for travel to our area offices nationwide, and to company-funded seminars on computer communications. Specify Job #CCorp 60

Please send resume with salary history to:

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Human Resources Department
3200 Park Center Drive, Suite 1500
Costa Mesa, CA 92626

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IBM SOFTWARE DESIGN & SALES

DUQUESNE SYSTEMS, the leading supplier of IBM mainframe productivity enhancement software, has outstanding career opportunities at our corporate headquarters in Pittsburgh and in our sales offices in Chicago, Los Gatos (CA), Atlanta, and the NY/NJ area. All applicants should be thoroughly knowledgeable in IBM mainframe architecture and terminology. DUQUESNE's products include SDSI, STAM, SCON, PMO, QUICKFETCH, CPO and QCM.

ACCOUNT REPRESENTATIVE This is a large commission opportunity in a territory of 250-300 large data centers. These sales positions are available in all offices.

MARKETING We have a wide range of opportunities for experienced software marketing professionals in the Pittsburgh headquarters and California sales office.

SYSTEMS DESIGNERS This is a unique opportunity for top-notch system designers and programmers to develop new systems software products related to MVS and VM. Applicants should be expert in operating systems and be experienced in assembly language. Knowledge of the internals of MVS, VM, IMS or CICS is a big plus. These positions are available in Pittsburgh.

DUQUESNE SYSTEMS was established in 1970 and became a public company in 1984. We offer a superior benefits package including an Incentive Stock Option Plan and other entrepreneurial incentives. EOE. Send resume of employment and all transcripts to Professional Recruiting Dept (No agencies!).

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COMPUTER
MANAGER of USER SERVICES
The Dept of University Computer Systems

The University is looking for an individual with technical and management skills to direct the User Services group within the Department of University Computer Systems. The Manager of User Services directs a staff of 20 full time and student employees who consult with users, teach workshops, install and maintain user-oriented software products, create and distribute documentation, manage the Departmental microcomputer laboratory, and provide other advisory and educational assistance to the Department and to the University as a whole. Applicants must have had several years of technical exposure to VM/OMS and MVS and should have had one or more years of managment experience in a related field. Excellent oral and written skills are required. A four year or advanced degree in computer science is highly desirable. Good interpersonal skills are necessary. Contact: MALCOLM L. TOEDT, Director of Computer Systems.

UNIVERSITY OF CONNECTICUT
Dept. of University
Computer Systems
Math-Sci Building
U-138, Storrs, CT 06268
Applications will be considered as of 8/1/84 (SEARCH 3F323)
AA/EOE

Associate Vice President For Instructional Computing

Old Dominion University will be initiating an aggressive five-year academic computing plan and seeks an individual who will provide university leadership in the development of a sound academic computing program. The University will install a new academic mainframe, minicomputers and microcomputer clusters during 1984-85 and is in the process of integrating computing facilities. The individual filling this position will be expected to work with deans and chairpersons in the development and implementation of computer-based education, CAD/CAM and faculty development programs. The position will report to the Vice President for Academic Affairs. A doctorate, research and teaching experience are highly desirable. Persons with equivalent experience in non-academic settings will also be considered.

Old Dominion University is located in Norfolk, Virginia, a metropolitan area of over one million population. The university serves over 15,000 students with a comprehensive undergraduate liberal arts curriculum and professional programs in engineering, education and general health-related areas. Eleven doctoral and thirty-eight master's degree programs constitute the graduate offerings of the university.

The position will be available November 1, 1984 or sooner if possible. Applicants should submit resumes, names of at least three references and a letter relating their experience and interests to this career opportunity by September 1, 1984. Please send nominations and applications to: Dr. Thomas P. Wallace, Office of the Vice President for Academic Affairs, Old Dominion University, Norfolk, VA 23508.

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SYSTEM SUPPORT SPECIALIST TELECOMMUNICATIONS

St. Joseph Mercy Hospital is a progressive 312-bed acute care facility located in North Central Iowa. We are currently seeking an individual for a position within our Management Information Systems Department as a Systems Support Specialist in the area of telecommunications.

This individual will be responsible for the installation and on-going management/maintenance, and enhancement of the various order communications, office automation, local area network, and information center systems.

Qualified applicants must possess a Master's degree in Business Administration or Computer Science, or a Bachelor's degree in the same with 3 years of job related experience. The successful candidate will have a good working knowledge of hospital operations, local area networks, order entry/communication systems, and microcomputer technologies. The ability to communicate effectively with all levels of management is a must.

This is a challenging opportunity with a competitive salary and full benefit package. Interested applicants please send a personal resume and salary requirements in confidence to:

Personnel
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84 Beaumont Drive
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Your responsibilities will be to provide pre and post sales systems support to our clients on Diebold terminal systems and host application software. Duties include system definition, design, installation and development support.

This unique opportunity offers salary commensurate with background and qualifications. Fluency in a foreign language would be a plus.

Interested, qualified candidates are requested to forward a resume together with pertinent salary information, in complete confidence, to: **Mr. Stephen Glick, DIEBOLD, INCORPORATED, P.O. Box 8230, Canton, Ohio 44711.** An equal opportunity employer m/f/h.

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PROGRAMMER ANALYST

The Trane Company, a leading manufacturer of air conditioning products has positions available for Programmer Analysts.

Applications include responsibility for company-wide payroll and financial systems development in an MVS, IMS, DB/DC environment, as well as personal computer applications.

Preferred candidates will have 1 to 4 years related professional experience.

The Trane Company headquarters are in LaCrosse, Wisconsin, a beautiful medium size city on the Mississippi River, LaCrosse is a business, cultural, educational and recreational center and an ideal place to live and work. Interested candidates should send resume and salary history in confidence to:

Bill Marshall
The Trane Company
Department 205
3600 Pammel Creek Road
LaCrosse, WI 54601
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Personnel Director
P.O. Box 8217
Roanoke, Virginia 24014

DATACARE

Chair in Computer Science

Applications are invited for appointment to the first Chair in Computer Science at La Trobe University.

Initially the person appointed will be Chairman of the Department of Computer Science within the planned new School of Mathematical and Information Sciences and will assist with the formation and development of this School.

The person appointed will be expected to provide research leadership and to further the development of the Department at both undergraduate and postgraduate levels. Applicants should have a broad knowledge in the discipline of Computer Science, including an appreciation of the hardware aspects of computer systems, and have demonstrated research expertise.

In its submission to the Commonwealth Tertiary Education Commission for the 1985-87 Triennium, the University proposes a major development in artificial intelligence, particularly in knowledge engineering and cognitive science. The Professor would be expected to foster such a development and, in doing so, co-operate with (i) a wide range of disciplines within the University (including Psychology, Linguistics, Philosophy, Electronic and Communication Science, mathematics and Music) and (ii) with appropriate groups outside the University (from business, industry and government).

Applications marked 'In confidence', quoting reference number 150/59/1, including the names of three referees and a curriculum vitae, should be forwarded to the Staff Officer, La Trobe University, Bundoora, 3083, Australia, by 26 October 1984. LT284

La Trobe University, Australia

THE UNIVERSITY OF IOWA HOSPITALS AND CLINICS

Assistant Director - Patient Care Applications

The Information Systems Department supports the patient-oriented computing requirements for The University of Iowa Hospitals and Clinics. The Department is currently developing a patient centered Hospital Information System. Application development and operation is carried out on two IBM 3081-Ds under MVS/XA utilizing PL/1 and IBM's Patient Care System. The system currently supports 600 terminals in applications ranging from patient registration and appointment scheduling to laboratory result reporting.

Candidates for this position should possess a Master's degree in a Computer Science related area or an equivalent combination of education and experience. Progressively responsible and extensive technical, administrative, and supervisory experience in health care and related data processing is required.

Send resume and salary history to:

James R. Wagner, Director
Information Systems
Department
University of Iowa
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Iowa City, Iowa 52242

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Director of Computing Services
220 Administrative Services Bldg
University of Arkansas
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Data Base Analyst — 3 or more years' data processing experience with a working knowledge of IMS DB/DC and either COBOL or assembler, as well as IMS backup/recovery utilities.

Sr. Systems Analyst — 5+ years' experience in the design and implementation of manufacturing financial or marketing systems in a large IBM mainframe environment. Experience in MRP II is a plus.

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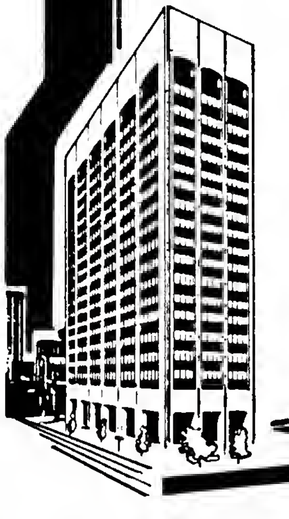
The Midland has an immediate opening for an EDP Internal Auditor to work on the Home Office Internal Audit Staff.

Responsibilities include systems software, application programming, and operating procedure audit reviews. In addition, the incumbent in this position will monitor the development of new data processing systems. To qualify for this position, a candidate must possess a bachelor's degree in Accounting or Computer Science. CPA or CISA designation or pursuing either designation is required with 2-3 years of EDP auditing experience.



We offer a salary fully commensurate with your background and qualifications along with a competitive benefit program.

Interested and qualified candidates should forward their resumes and salary requirements to: **William F. Siemon, 2nd Vice President — Human Resources, THE MIDLAND MUTUAL LIFE INSURANCE COMPANY, 250 East Broad Street, Columbus, Ohio 43215.**

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We are in need of a programming-skilled EDP Auditor to join our Internal Audit department staff. Responsibilities include the development/maintenance of audit software, and conducting/assisting audits of EDP operations and systems under development. Our environment includes an IBM 4381 under DOS/VSE with VOLLIE, LIBRARIAN, DYL-280/AUDIT, and Systematics Banking software.

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System Director Of Operations University Computing Services

Ball State University is searching for an Assistant Director For Operations in Computing Services, which is a continuing twelve-month contract position. A Bachelors' Degree is required in Management, Management Information Systems, Computer Science, Business Administration or related field(s). Successful applicant will have a minimum of five years experience in computing or data processing with increasing leadership responsibilities. Responsibilities include planning, developing policy and procedures, and directing the computer operations, systems software support, quality control, data entry, electronic communications and equipment repair. Computing resources include an IBM 3083, a cluster of VAX 780 computers, an Intergraph Graphics System, and Nixdorf Data Entry equipment, all located in a brand new computing center. Send resume, official transcripts and three references to

Dr. Dennis L. Kraner, Director Of
University Computing Services,
Ball State University,
Muncie, IN 47306.

Position will be open until filled, but selection will begin on August 13th, 1984. Ball State University is state-supported and is located in Muncie, a city of over 80,000 people approximately 55 miles northeast of Indianapolis. Excellent fringe benefits and salary commensurate to candidates experience. Ball State University practices Equal Opportunity in Education and Employment.

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–Data Base Consultants
–MVS/DOS/VM Technical Support
–Systems Programmers (MVS/VTAM/NCP)
–Systems Analysts/Programmers (DB/DC)

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Primary responsibilities of this position are to work in a matrix environment with major business departments such as Sales, Marketing, Finance, Personnel and Accounting to develop management information systems in support of corporate objectives. Specific assignments will Include: applications development, user Interface, systems feasibility and planning, systems analysis and design, user training, project leadership, and other special projects.

Therefore, at least 5 years of experience working with a medium-to-large corporation as a systems analyst or project leader Is required. A bachelor's degree in business with an emphasis in accounting/finance and previous experience with large-scale accounting/finance development projects are essential.

We offer an excellent total compensation and benefits package including bonus program, stock options, profit sharing, comprehensive group health, dental and life insurance benefits. Please send a detailed resume including salary history, In confidence, to:

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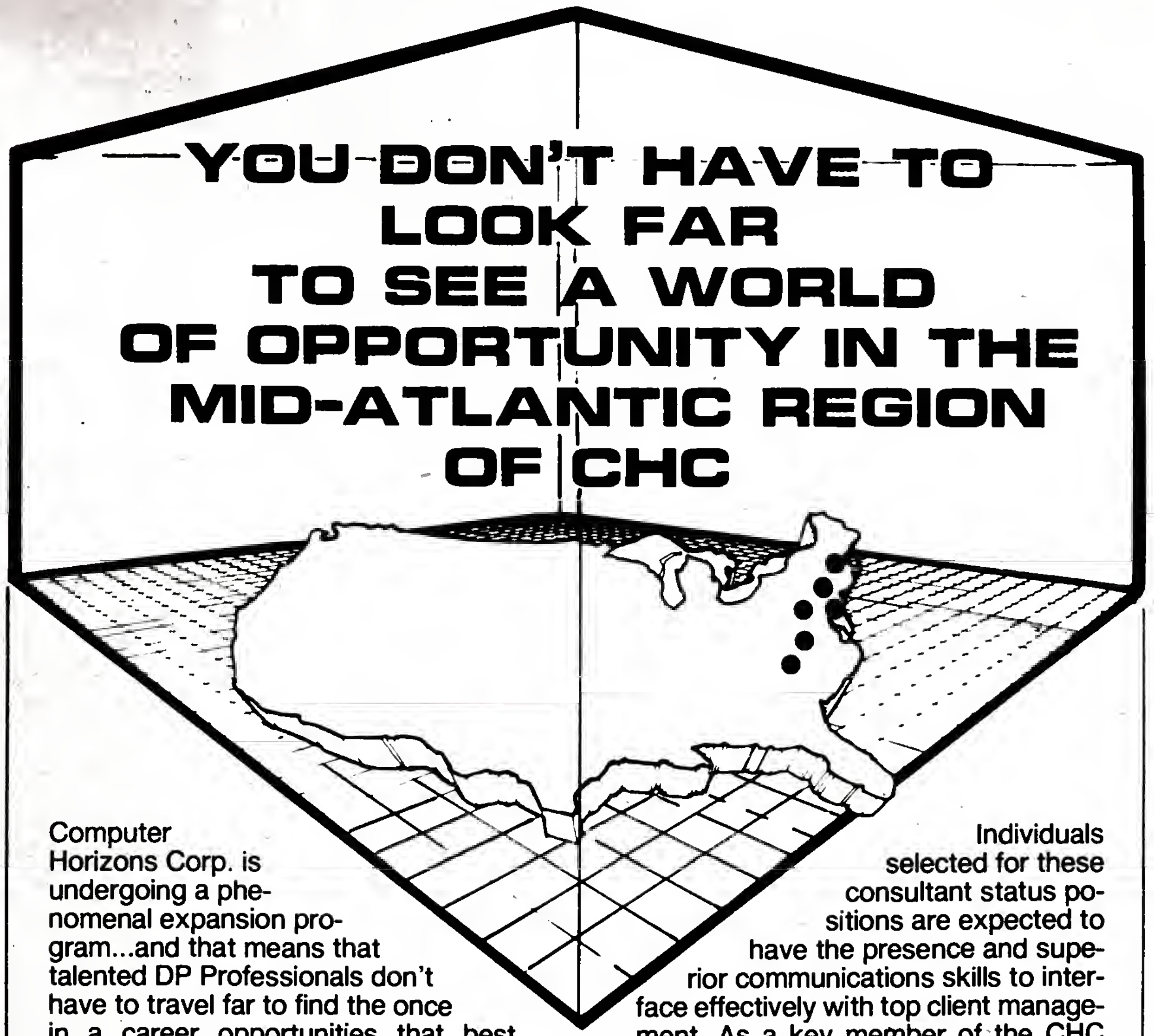

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Must have experience with IBM software such as OS, VM/370, PL/I, FORTRAN, and CMS. Should be familiar with use of discs and tapes. Experience with microcomputers, especially IBM PC's highly desirable.

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Candidates should have a strong understanding of the role of computing and information services in a university environment and should possess demonstrated management ability and an in-depth knowledge of information technology. Candidates should relate well to students, faculty and staff and should provide sound and innovative leadership. Salary is commensurate with qualifications. Applicants are invited to forward their resume along with a list of three references including address and telephone numbers to:

Mr. Martin Cominsky, Staff Officer
Vice Chancellor for Computing Committee
Office of the Chancellor
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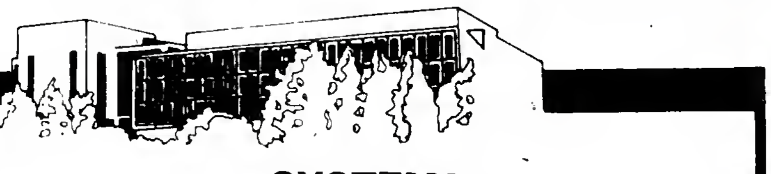

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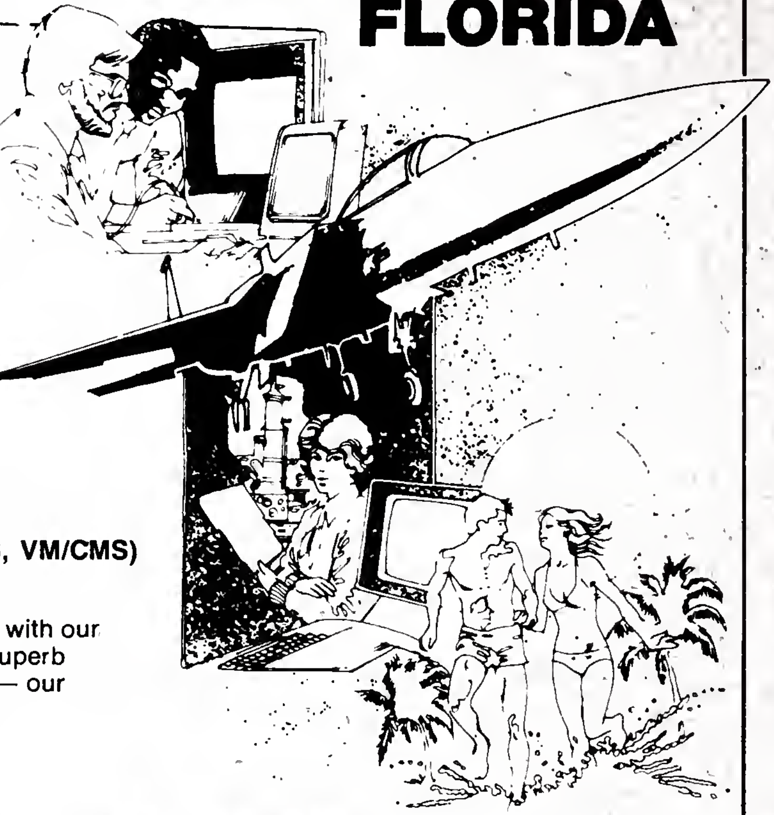

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IBM System 38 Programmers Programmer/Analysts

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H&M
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PROGRAMMERS

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You will review current and emerging software and hardware technologies and be involved with the prototyping of applications in a variety of personal, micro and mini computers. Must be knowledgeable in software, especially personal computers, graphics, UNIX and artificial intelligence. Individual must be technically-well versed, comfortable with hardware and communications on the conceptual level and be willing to program and attend trade shows. Excellent communication skills required.

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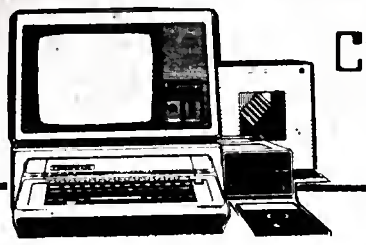

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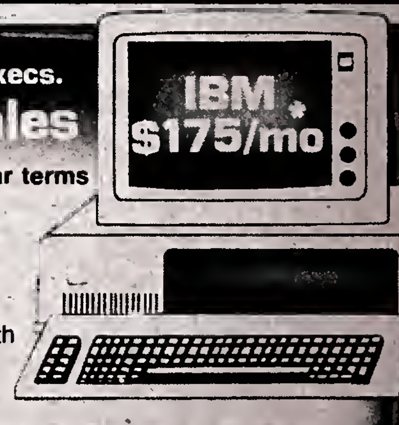

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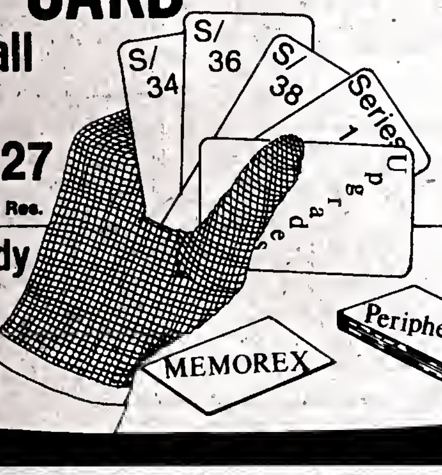

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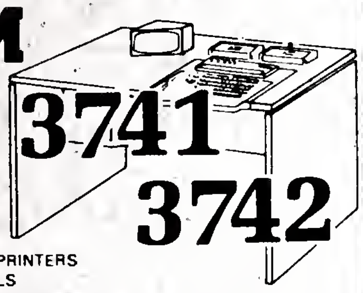

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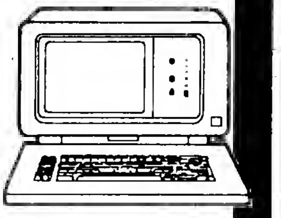

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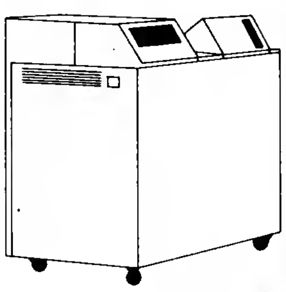

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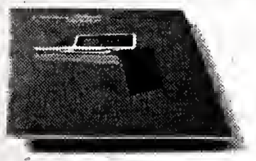

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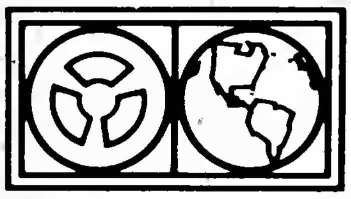

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Ian Mclean, Asia Computerworld Pte. Ltd., 2023 Swire House, 9 Connaught Rd. Central, Hong Kong. Phone: 210395. Telex: (780) 72827 HX COMWR.

Saudi Arabia: Mr. Omar Dusuki, General Manager, Saudi Computerworld, P.O. Box 5455, Jeddah. Phone: 6519690. Telex: (928) 401205.

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Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701
Phone: (617) 879-0700, Telex: 95-1153.

SALES National Director, Edward P. Marecki. **Corporate Advertising Administrator**, Frank Collins. **Manager/Marketing & Sales Operations**, Kathy Doyle. **Display Advertising Supervisor**, Anne Hadley. **Display Advertising**, Deborah Bryer, Pam Valentinas, Carolyn Medeiros, Cindy Chekas, Mary Waddick. **Classified Operations Manager**, Cynthia Delany.

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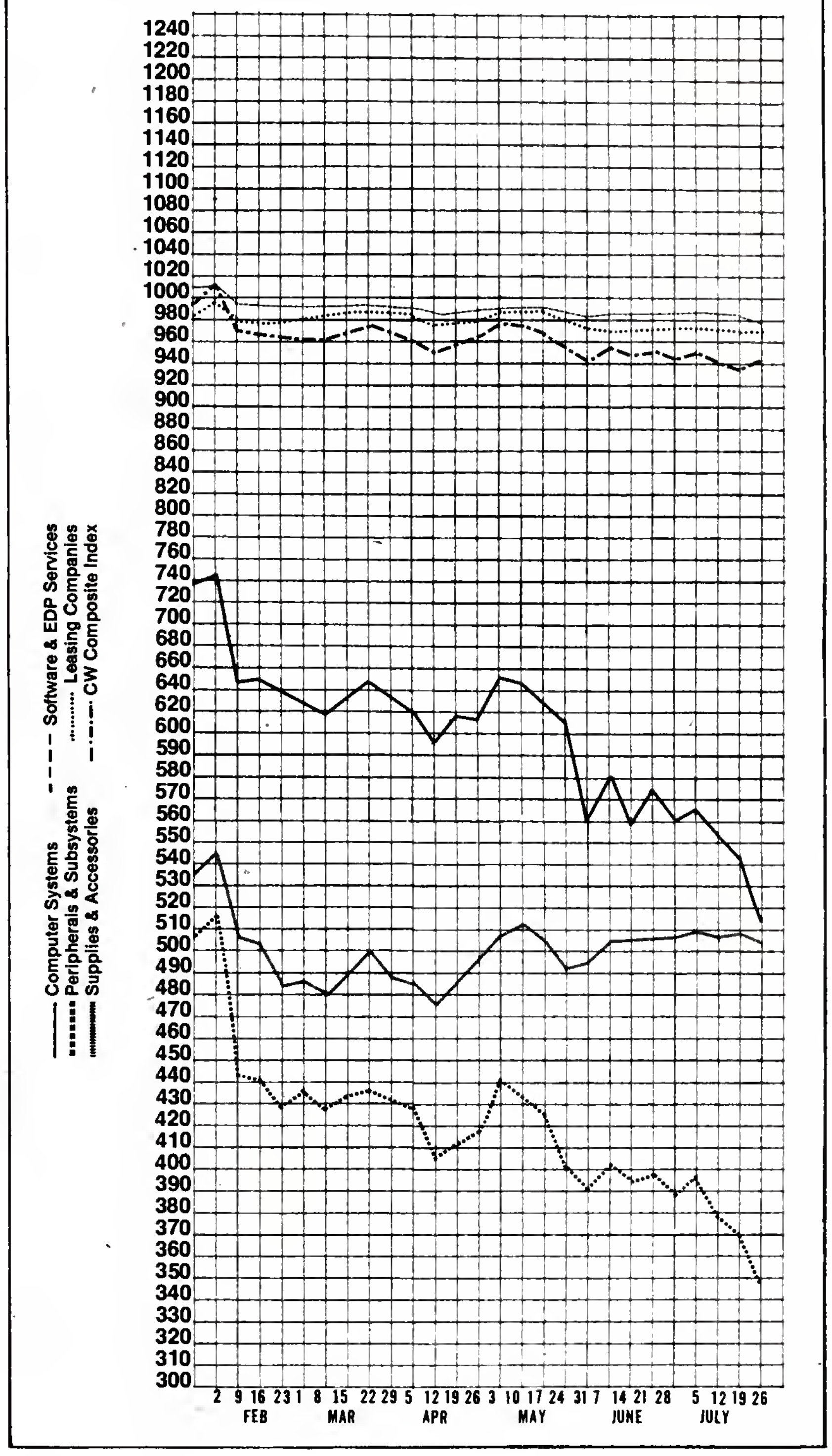
Computerworld Stock Trading Index



TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 25, 1984

All statistics compiled, computed and formatted by TRADE QUOTES, INC Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1983-84 RANGE (1)	CLOSE JUL 25 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8- 24	8 3/4	-1 3/4	-16.6
O	ALTOS COMPUTER SYST	8- 21	9	-1 1/4	-12.1
A	AMDAHL CORP	10- 30	8 3/4	- 1/4	-2.5
O	APPLE COMPUTER INC	18- 63	26 3/4	+1 3/8	+5.4
N	AT&T	15- 21	18 1/8	+ 1/2	+2.8
N	BURROUGHS CORP	44- 58	49 5/8	-3 3/8	-6.3
O	COMPUTER AUTOMATION	5- 17	4 7/8	- 1/2	-9.3
A	COMPUTER CONSOLES	14- 26	16 1/4	- 1/4	-1.5
N	CONTROL DATA CORP	25- 62	25 1/4	-3 1/2	-12.1
O	CONVERGENT TECHNOL	10- 41	10 1/4	+ 5/8	+6.4
N	CRAY RESEARCH INC	39- 58	42 7/8	-3	-6.5
N	DATA GENERAL CORP	27- 49	40 1/2	-4 1/8	-9.2
N	DATAPOINT CORP	18- 31	16	-1 5/8	-8.2
N	DIGITAL EQUIPMENT	64-125	78 1/8	-3	-3.6
A	EECO INC	12- 16	13 5/8	+ 1/8	+0.9
N	ELECTRONIC ASSOC.	3- 15	3	- 3/8	-11.1
N	FLOATING POINT SYST	13- 44	16 3/8	+ 1/8	+0.7
N	FOXBORO	29- 47	30	0	0.0
O	GENERAL AUTOMATION	7- 18	7 3/8	-1 1/4	-14.4
N	GOULD INC	24- 44	25 3/8	-1 5/8	-6.0
N	HARRIS CORP	23- 48	24 7/8	- 3/8	-1.4
N	HEWLETT-PACKARD CO	31- 48	34 7/8	- 1/8	-0.3
N	HONEYWELL INC	48- 69	50 3/4	+1	+2.0
N	IBM	103-134	107 1/8	- 3/8	-0.3
O	IPL SYSTEMS INC	3- 14	3	- 3/8	-11.1
N	M/A-COM INC	13- 35	17 1/4	- 1/2	-2.8
N	MANAGEMENT ASSIST	8- 26	24 3/8	-1	-3.8
N	MATSUSHITA ELEC(ADR)	80- 88	80 7/8	-1 1/8	-1.8
N	MODULAR COMPUTER SYS	6- 16	7 1/8	- 1/2	-6.5
N	MOHAWK DATA SCI	9- 17	12	- 1/2	-4.0
N	MOTOROLA INC	29- 49	33 3/8	- 1/2	-1.4
N	NAT'L SEMICONDUCTOR	11- 20	10 1/2	- 1/4	-2.3
N	NBI INC	17- 38	17 3/4	-2 5/8	-12.8
N	NCR	21- 34	21	-1 3/4	-7.6
N	PERKIN-ELMER	18- 37	18 1/4	-1 1/4	-6.4
M	PRIME COMPUTER INC	11- 28	13 3/4	+ 3/8	+2.8
N	SPERRY CORP	35- 50	35 1/4	- 1/4	-0.7
O	TANDEM COMPUTERS INC	16- 40	16 5/8	-4 3/4	-22.2
N	TANDY CORP	25- 62	26	0	0.0
O	TELEVIDEO SYSTEMS	4- 41	3 7/8	-1 5/8	-29.5
O	TELXON CORP	8- 18	10 1/2	- 1/4	-2.3
N	TEXAS INSTRUMENTS	101-168	115 1/4	-4	-3.3
A	ULTIMATE CORP	15- 24	17 1/4	-2 1/8	-10.9
O	VECTOR GRAPHICS INC	1- 8	3/4	0	0.0
A	WANG LABS "B"	24- 42	23 1/2	-1 1/2	-6.0
A	WANG LABS "C"	24- 42	23 5/8	-1 1/4	-5.0
N	XEROX CORP	35- 52	35 1/2	-1 1/4	-3.4

LEASING COMPANIES

EXCH		PRICE 1983-84 RANGE (1)	CLOSE JUL 25 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	10- 21	19 1/2	0	0.0
N	COMDISCO INC	10- 42	10 3/4	- 1/8	-1.1
O	CONTINENTAL INFO SYS	5- 16	5	- 3/8	-8.8
N	DPF INC	10- 15	11 1/2	- 1/4	-2.1
O	PHOENIX AMERICAN INC	6- 17	8 1/4	- 1/8	-1.9
O	SELECTERM INC	11- 21	12 1/2	- 1/2	-3.8
N	U.S. LEASING	28- 44	28 3/4	- 3/4	-2.4

COMPONENTS

EXCH		PRICE 1983-84 RANGE (1)	CLOSE JUL 25 1984	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	25- 37	26 7/8	-2 5/8	-8.8
O	ADV'D SEMICONDUCTOR	18- 38	16	-1	-5.8
N	ANALOG DEVICES INC	20- 32	21 5/8	- 3/4	-3.3
O	ANALOGIC CORP	10- 31	10	- 1/4	-2.4
N	APPLIED MAGNETICS CP	8- 37	8 7/8	+ 3/4	+8.2
N	TERADYNE	23- 38	22 1/2	-1 1/4	-5.2

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1983-84 RANGE (1)	CLOSE JUL 25 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	3- 8	3 1/4	0	0.0
N	ADVANCED SYSTEMS INC	14- 22	14 3/4	- 5/8	-4.0
O	AGS COMPUTERS INC	11- 32	10 1/2	-1 1/2	-12.5
O	AMERICAN SOFTWARE	13- 31	12 5/8	- 1/8	-0.8
N	ANACOMP INC	2- 18	2 1/4	0	0.0
O	ANALYSTS INTL CORP	5- 17	5 1/4	- 1/4	-4.5
A	APPLIED DATA RES.	18- 37	18 3/8	- 3/4	-3.9
O	ASK COMPUTER SYSTEMS	13- 21	16	- 1/2	-3.0
B	ASTRADYNE COMP IND	1- 7	1 7/8	+ 1/4	+15.3
N	AUTOMATIC DATA PROC	30- 44	35 1/2	0	0.0
O	CGA COMPUTER ASSOC	9- 17	12	+ 3/4	+6.6
O	COMPUTER ASSOC INT'L	15- 35	15 3/4	-1 1/4	-7.3
O	COMPUTER HORIZONS	8- 20	5 3/4	- 1/2	-8.0
O	COMPUTER NETWORK	5- 11	5 1/4	- 3/8	-6.6
N	COMPUTER SCIENCES	11- 23	11 1/2	- 1/4	-2.1
O	COMPUTER TASK GROUP	12- 19	14 1/4	+ 1/4	+1.7
O	COMPUTER USAGE	6- 18	8	- 1/2	-5.8
O	COMPUTONE SYSTEMS	4- 23	3 3/4	- 3/8	-9.0
O	COMSERV CORP	1- 16	1 1/4	- 7/8	-41.1
O	COMSHARE	7- 14	7 1/2	- 3/8	-4.7
N	CULLINET SOFTWARE	24- 50	35 1/8	-1 1/2	-4.0
O	CYCARE SYSTEMS INC	16- 25	18 3/4	-1	-5.0
N	ELECTRONIC DATA SYST	25- 44	43 5/8	+ 1/2	+1.1
O	HOGAN SYSTEM INC	10- 27	10	- 1/2	-4.7
N	GENERAL ELECTRIC CO	45- 59	49 1/2	- 1/4	-0.5
N	GTE CORP	36- 48	37 3/4	+ 1/8	+0.3
N	INFORMATICS INC	15- 32	16	+ 5/8	+4.0
O	INFORMATION SCIENCE	5- 17	5	0	0.0
O	INFOTRON SYSTEMS CP	24- 43	24 1/4	-3 3/4	-13.3
O	KEANE ASSOCIATES	6- 15	9 3/4	0	0.0
A	LOGICON	18- 31	23 1/8	- 3/4	-3.1
O	MCI COMMUNICATIONS	6- 28	6 3/8	- 1/2	-7.2
O	MNGT SCI AMER INC	11- 33	10 3/4	- 1/4	-2.2
O	MATHEMATICAL APP GRP	6- 18	7	0	0.0
O	MICOM SYSTEMS INC	31- 50	34	+3	+9.8
O	MONCHIK-WEBER CP	6- 22	8 1/8	+ 3/8	+4.8
O	NATIONAL DATA CORP	14- 26	15	0	0.0
O	ON-LINE SOFTWARE INT	8- 29	9 1/2	- 1/4	-2.5
O	PANSOPHIC SYSTEMS	11- 30	12 3/4	- 3/4	-5.5
N	PLANNING RESEARCH	12- 21	11 3/4	-2 1/8	-15.3
O	POLICY MGMT SYSTS CP	22- 35	24	-2 1/2	-9.4
O	PROGRAMMING & SYS	4- 8	4 5/8	- 1/4	-5.1
O	REYNOLDS & REYNOLD	28- 53	28	+ 1/2	+1.8
O	SEI CORP	13- 34	13 1/2	-1 3/4	-11.4
O	SHARED MEDICAL SYST	23- 43	23 1/2	-4 1/8	-14.9
O	SCIENTIFIC COMPUTERS	8- 14	8 1/2	- 1/2	-5.5
O	SOFTWARE AG	9- 14	10 1/8	- 3/8	-3.5
N	URS CORP	10- 18	10 3/8	0	0.0
N	UCCEL	7- 17	8 1/4	+ 1/4	+3.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1983-84 RANGE (1)	CLOSE JUL 25 1984	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 7	2 3/4	- 1/8	-4.3
A	ANDERSON JACOBSON	7- 26	8 1/2	-1	-10.5
O	AUTO-TROL TECHNOLOGY	11- 29	11 1/8	- 1/4	-2.1
O	AVANT-GARDE COMPUTNG	15- 29	17 1/4	- 3/4	-4.1
O	BANCTEC INC	7- 22	6 3/4	-1	-12.9
A	BEEHIVE INT'L	2- 15	2 1/4	- 3/8	-14.2
N	BOLT,BERANEK & NEW	17- 30	16 5/8	-1 1/4	-6.9
O	CAMBEX CORP	1- 3	1 1/8	0	0.0
N	CENTRONICS DATA COMP	9- 28	9	-1 1/4	-12.1
A	CETEC CORP	7- 12	7 5/8	- 1/8	-1.8
A	COGNITRONICS	5- 20	4 5/8	- 1/8	-2.6
O	COMPUTER DEVICES INC	0- [illegible]	1/2	0	0.0
O	COMPUTER TRANSCEIVER	2- 10	2	0	0.0
N	COMPUTERVISION CORP	29- 53	34 3/4	+1 1/2	+4.5
N	CONRAC CORP	11- 24	12 7/8	- 3/8	-2.8
A	DATAPRODUCTS CORP	16- 32	16	-1 7/8	-10.4
A	DATARAM CORP	7- 12	7 3/8	-1	-11.8
O	DATA SWITCH CORP	6- 41	6	-7	-53.8
O	DATUM INC	6- 17	5 3/4	- 1/8	-2.1
O	DECISION DATA COMPUT	9- 16	9 5/8	- 1/4	-2.5
O	DOCUTEL-OLIVETTI	7- 39	7 1/2	- 7/8	-10.4
N	ELECTRONIC M & M	5- 11	5 5/8	- 1/2	-8.1
O	ENDATA, INC	9- 16	8 1/2	- 1/4	-2.8
O	EVANS & SUTHERLAND	13- 50	13 1/4	-1 1/2	-10.1
O	GANDALF TECHNOLOGIES	8- 13	10 1/2	- 1/8	-1.1
N	GEN'L DATA COMM IND	10- 17	14	- 3/8	-2.6
O	GREAT SOUTHWEST IND	1- 3	1/2	- 1/4	-33.3
N	HAZELTINE CORP	18- 31	24 1/2	- 1/2	-2.0
O	ICOT CORP	3- 8	3 3/8	- 3/8	-10.0
O	INFORMATION INTL INC	10- 19	10 1/4	+ 1/4	+2.5
O	INTEL CORP	27- 45	27	-2	-6.8
O	IPL SYSTEMS INC	3- 14	3	- 3/8	-11.1
A	LUNDY ELECTRONICS	7- 19	6 7/8	- 3/8	-5.1
O	MEGADATA CORP	8- 15	11 1/2	- 1/4	-2.1
A	MSI DATA CORP	10- 25	9 3/4	-1 3/4	-15.2
N	NASHUA CORP	19- 29	24 1/8	-2 1/8	-8.0
O	NETWORK SYSTEMS CORP	16- 34	19 7/8	- 7/8	-4.2
N	NO AMERICAN PHILIPS	30- 40	31 1/4	+ 1/4	+0.8
N	NORTHERN TELECOM LTD	30- 49	34	+ 3/8	+1.1
O	OMEX	1- 6	3/8	0	0.0
N	PARADYNE CORP	12- 26	11 3/4	- 1/4	-2.0
A	PENRIL CORP	9- 14	11 3/8	-1 1/4	-9.9
O	PHOENIX AMERICAN INC	6- 17	6 1/4	- 1/8	-1.9
N	PLESSEY CO (ADR)	25- 41	24 1/2	-2 1/8	-7.9
O	PRINTRONIX INC	16- 34	16	0	0.0
O	RAMTEK CORP	6- 23	7 1/4	0	0.0
N	RECOGNITION EQUIP	10- 17	9 3/4	0	0.0
N	ROLM CORP	30- 80	38 5/8	+ 1/4	+0.6
N	SANDERS ASSOCIATES	36-120	39	-1 3/4	-4.2
O	SCAN DATA	1- 3	3/8	0	0.0
O	SCAN-TRON CORP	9- 19	8 3/4	-1 1/8	-11.3
N	SCIENTIFIC ATLANTA	8- 23	7 5/8	- 1/4	-3.1
N	STORAGE TECHNOLOGY	7- 23	7 3/8	-1 1/8	-13.2
O	SYKES DATATRONICS	2- 13	2 1/4	- 3/8	-14.2
O	SYSTEMS & COMP TECH	20- 39	23 1/2	-1 1/4	-5.0
A	T BAR INC	7- 17	9 1/8	+ 1/4	+2.8
A	TAB PRODUCTS CO	13- 20	13 5/8	-1 1/2	-9.9
O	TANDON CORP	7- 35	8	+ 3/8	+4.9
A	TEC INC	6- 12	9 1/2	- 1/4	-2.5
N	TEKTRONIX INC	52- 87	51 3/4	-2 3/8	-4.3
N	TELEX	19- 32	26 5/8	-1	-3.6
O	TESDATA SYSTEMS CP	3- 17	2 1/2	- 1/2	-16.6
N	TIMEPLEX INC	13- 23	13 1/8	+ 3/8	+2.9
O	VISUAL TECHNOLOGY	9- 26	8 3/4	- 1/2	-5.4

SUPPLIES & ACCESSORIES

EXCH		PRICE 1983-84 RANGE (1)	CLOSE JUL 25 1984	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	17- 23	20 3/4	0	0.0
N	BARRY WRIGHT	22- 33	27	+ 1/8	+0.4
A	DUPLEX PRODUCTS INC	22- 27	23 1/4	- 1/2	-2.1
N	ENNIS BUS. FORMS	18- 28	19	- 5/8	-3.1
N	3M COMPANY	69- 90	75 5/8	+ 1/4	+0.3
N	MOORE CORP LTD	35- 51	38	- 5/8	-1.6
O	STANDARD REGISTER	27- 35	33 1/4	0	0.0
N	WALLACE COMP SERVICE	23- 33	26 1/2	- 5/8	-2.3

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14. Create a salary administration worksheet on a PC using MSA's Payroll/Personnel System.

15. Make a purchase order adjustment without leaving your workstation.

16. Download current balances from General Ledger to graph actual vs. planned.

17. Capture data from MSA's Fixed Assets System, use PeachCalc™ to create a lease amortization model.

18. Access available funds data in MSA's Budgetary Control System...

19. Use PeachCalc™ to project expenditure through year-end.

20. Use MSA's Manufacturing System data to produce cost/margin analysis with PeachCalc.™

21. Dial up subscriber databases to access current credit information for customers...

22. Use PeachCalc™ to analyze information, set credit and update your mainframe Accounts Receivable data.

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Executive Peachpak II also includes PeachCalc,™ an electronic spreadsheet. A Business Graphics System for color charts and other graphics. Telecommunications that let personal computers talk to each other—or link to resources such as Dow Jones News/Retrieval.® PeachText,™ complete report production system that lets executives edit and footnote reports. A List Manager for organization. And PeachLink,™ the software that links your PCs to the mainframe.

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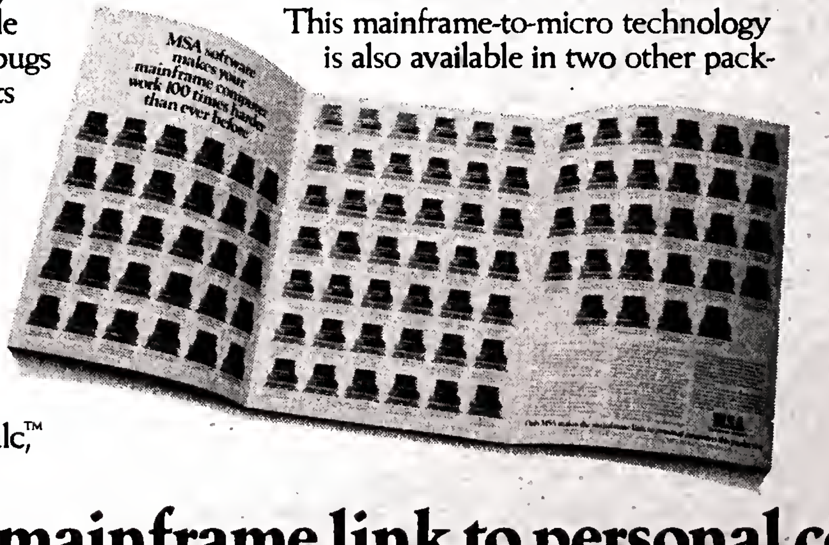

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MSA makes the mainframe link to personal computers a reality

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